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ABSTRACT

Provided are summaries of conference presentations discussing aspects of birth, parent/child interaction, and attachment behavior. Material in part I explores perspectives on pregnancy and the perinatal period. Included are discussions of birth in nonindustrial societies, progress in the study of maternal behavior in animals, the physiological effects of a supportive companion during labor and the milieu and obstetrical positions during labor. In part II, summaries concern infants' and mothers' contributions to attachment. Topics discussed are early caregiving and later patterns of attachment, the transmission of affect between mothers and infants, studies of parent/infant bonding, maternal stress following the birth of a second child, the father's role in family development, and the father/child relationship. Part III focuses on the development of relationships in high-risk situations. Specific attention is given to the uses of behavioral assessment of premature infants in the context of intervention, findings of an anthropological study of a special care nursery, the impact of medical complications on parental behavior in the premature nursery, family-oriented intervention with failure-to-thrive infants, support for hospital caregivers, and staff burnout in the neonatal intensive care unit. Applications of recent research findings to clinical care are discussed in part IV. (RH)

Pediatric Round Table: 6

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Birth, Interaction And Attachment

Exploring The Foundations For Modern Perinatal Care

Edited by Marshall H. Klaus, M.D.
and Martha Oschrin Robertson

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*BIRTH,
INTERACTION
and
ATTACHMENT*

Exploring the Foundations for
Modern Perinatal Care

Edited by
Marshall H. Klaus, M.D.
and
Martha Oschrin Robertson

Introduction by
Marshall H. Klaus, M.D. and
John H. Kennell, M.D.

Sponsored by

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*To all the caretakers who help
families grow during the perinatal period*

Contents

List of Participants	ix
Preface	xiii
Introduction	
John H. Kennell and Marshall H. Klaus	xv
<i>PART I — PERSPECTIVES ON PREGNANCY AND THE PERINATAL PERIOD</i>	xix
Birth in Non-Industrial Societies	
Betsy Lozoff, M.D.	1
Commentary*	
Brigitte Jordan, Ph.D.	7
Progress in the Study of Maternal Behavior in Animals	
Jay S. Rosenblatt, Ph.D.	9
The Physiologic Effects of a Supportive Companion (Doula) During Labor	
John H. Kennell, M.D.	19
The Milieu and Obstetrical Positions During Labor: A New Approach from France*	
Michel Odent, M.D.	23
Commentary*	
Dora Henschel	29
<i>PART II — ATTACHMENT: PARENT $\longleftrightarrow$ INFANT</i>	33
Early Caregiving and Later Patterns of Attachment	
Mary D. Salter Ainsworth, Ph.D.	35
Mothers and Infants: The Early Transmission of Affect*	
Daniel Stern, M.D.	43

A Critical Examination of Studies of Parent-Infant Bonding Earl Siegel, M.D., M.P.H.	51
Maternal Stress Following the Birth of a Second Child Annette Lynch, R.N., M.S.N.	61
The Father's Role in Family Development Ross D. Parke, Ph.D.	66
Some Thoughts on the Father-Child Relationship Erna P. Furman	75
 <i>PART III — DEVELOPMENT OF RELATIONSHIPS IN HIGH RISK SITUATIONS</i>	
Behavioral Assessment of the Premature Infant: Uses in Intervention* T. Berry Brazelton, M.D.	85
The Special Care Nursery: An Anthropological Study Lucile Newman, Ph.D.	92
The Impact of Medical Complications on Parental Behavior in the Premature Nursery Klaus Minde, M.D., F.R.C.P.(C)	98
Family Oriented Intervention with the Failure-to-Thrive Infant Dennis Drotar, Ph.D. and Charles Malone, M.D.	104
Caring for the Caregivers Edna Adelson	112
Comments on Burn-out* Richard E. Marshall, M.D.	120
 <i>PART IV — CONCLUSION: WHERE TO GO FROM HERE?</i>	
Application of Recent Findings to Clinical Care Marshall H. Klaus, M.D.	129

*Taken from a transcript

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Preface

Although the conference on *BIRTH, INTERACTION AND ATTACHMENT* was not initially sponsored by the Johnson & Johnson Baby Products Company, its program certainly is one which admirably fits the company's Pediatric Round Table series prerequisites. We were, therefore, most flattered when the program's moderators, Marshall Klaus, M.D. and John Kennell, M.D., asked if we would consider including it in the Baby Products Company series of Round Table publications. Since these two well-known pediatricians were moderators of our first Round Table on *Maternal Attachment and Mothering Disorders*, we knew them to be old friends with mutual interests in pediatric health care and child development. As we read the manuscripts of the internationally preeminent group of scientific researchers and practitioners who participated in the conference on *BIRTH, INTERACTION AND ATTACHMENT*, we envied them the exciting talk and rewarding experience. We are, therefore, certainly most pleased to be able to include this publication in our series of Pediatric Round Table publications, and to share in making it available to the rapidly expanding audience of professionals and laymen who are concerned with developmental pediatrics.

BIRTH, INTERACTION AND ATTACHMENT is divided into four parts which explore the foundations of modern perinatal care. In Part I, six international authorities review and update "Perspectives on Pregnancy and the Perinatal Period"; in the second part, six other specialists consider, review and debate the basis of attachment from the point of view of infant and both parents; Part III addresses the "Development of Relationships in High Risk Situations" through the eyes of seven additional eminent researchers and clinicians; and in the final part Dr. Klaus considers what the future may

or perhaps should follow as the result of the current revolution in perinatal care. Publication of this volume, as part of the Johnson & Johnson Baby Products Company Pediatric Round Table series, seeks to help child health professionals and parents to share a better understanding of the attachment process.

*Robert B. Rock, Jr., M.A., M.P.A.
Director, Professional Relations*

Introduction

Marshall H. Klaus, M.D. and John H. Kennell, M.D.

In the past ten years there have been major changes in maternity practices relating to labor, birth and the early postnatal period in the United States and other industrialized nations. When family members and researchers were allowed to enter the fortresses of the premature nursery and the maternity unit, many challenging and fundamental questions were raised. As a consequence there followed a flood of investigations, resulting in new approaches and technology in perinatal care, and new concerns and demands from increasingly vocal consumers.

The effectiveness of some of the new approaches of the perinatologist and neonatologist for the survival of the fetus and neonate is in part established. But with these scientific and technological changes have come many more questions, especially concerning the high risk mother and her small or sick infant. What about possible detrimental effects on the later course of development of the infant who spends the first months of life in the premature nursery? What are the effects on the parents? The siblings? On the caretakers? Simultaneously other parents have enunciated and even shouted a chorus of questions asking why can't they enjoy a more natural, relaxed birthing experience, free of the stresses and environmental restraints associated with traditional perinatal care.

At the same time that the army of physiologists, biochemists, pharmacologists, clinicians and other researchers were studying and treating the medical disorders of the mother, fetus and newborn, other investigators were concerned with the behavioral outcomes for the healthy infant as well as the small and sick neonate. Fortunately the research of these behavioral scientists has been productive and provocative. At the same time those caring for mothers and infants have been

remarkably open to this new information and willing to change their care practices, to bring together and apply findings from physiologic and behavioral research.

The need for this conference, *Birth, Interaction and Attachment*, came from our awareness of exciting new studies and discoveries in several disciplines, and in laboratories as distant as France and Australia. There was important new information for clinicians, teachers, and researchers, from such disciplines as anthropology, animal behavior, developmental psychology, obstetrics, pediatrics, psychiatry, psychoanalysis and sociology. The reports at this conference suggest the need for even further changes in the care of the normal mother and baby, as well as the premature infant and his or her family.

In the first portion of the conference Lozoff and Jordan explore birth in other cultures, giving a new perspective to our obstetric and pediatric practices. The importance of animal research as a stimulus and guide in designing studies for humans is vividly demonstrated by Rosenblatt. From a hospital in Guatemala comes our data showing the benefits of a supportive companion in labor. The conference was most fortunate to have in attendance Michel Odent who, with characteristic French taste, has put together clinically much of what is presently known from recent research to be of value in human childbirth.

The second section, on bonding and attachment, begins with Mary Ainsworth, a leading investigator and theoretician in the field. Daniel Stern explores the intimate, rapidly developing relationships between mothers and their new infants and presents new insights about the significance of these relationships. The large number of studies of parent-infant bonding are then critically examined by Earl Siegel. Following a presentation by Lynch of the issues faced by mothers who have just delivered a second baby, the father's role in the family is discussed from two different vantage points by Parke and Furman.

In the third part Brazelton describes new methods of assessment for the premature and his or her parents. Newman takes an anthropologist's perspective, looking at the baby's environment in the Neonatal Intensive Care Unit, and Klaus Minde examines the effects of the NICU on parents' behavior. Intervention in the care of the failure-to-thrive infant is approached from a new perspective by Drotar. And considering those courageous individuals who live and work in the Neonatal Intensive Care Nursery, Adelson and Marshall discuss how the caretakers can be aided in their highly stressful positions. The concluding talk of the conference explores possible new directions for perinatal care.

The speakers are a group of active investigators and they present the reader with their provocative ideas, research plans and exciting new data. We hope you will explore these reports as a way to examine your own basic theoretical concepts upon which your own care procedures have been and will be formed. For non-clinicians reading this book, we hope it will provide a fuller understanding of the issues and problems that parents and caretakers face daily.

Those attending the conference came away with enthusiasm and an understanding of the need to fit these insights into the care of all the families who come to them. We have attempted to pass on some of that warmth and excitement, the challenge and stimulation of these presentations, along with the factual information, in this report.

PART ONE
PERSPECTIVES ON
PREGNANCY AND THE
PERINATAL PERIOD

Birth in Non-Industrial Societies

by *Betsy Lozoff, M.D.*

This is a time of great discontent about maternity care in the United States. Current criticism of hospital routines often implies that something meaningful has been lost which existed in our past and still exists in other cultures. There is often the assertion that in other cultures childbirth is closer to nature, with the mother in control of the birth process. Today I will evaluate some common ideas about childbirth in other societies. The data I present are based on analyses of childbirth descriptions by anthropologists in a standard sample of 186 non-industrial societies, where the subsistence economy is based on agriculture, herding, hunting and gathering, and fishing. The societies comprise a geographically, historically, and linguistically representative sample.

LABOR AND DELIVERY. Virtually all cultures have special methods to avoid painful, difficult births, implying that even in non-industrial societies there is anxiety about the pain and danger associated with childbirth. In our own colonial past the Puritans exhorted women to prepare for death as they approached childbirth. In less than 2% of world societies does the woman routinely give birth alone, and only in another 2% is a woman permitted to give birth alone. In the remaining 96% the mother is expected to have companionship, which can be most beneficial, as Klaus and Kennell have shown. In 62% of the 71 societies on which we had information, these companions try actively to influence the labor: manipulating, kneading, even bouncing on the abdomen. In the tribes with whom I worked in India, the assistant actually dilated the cervix manually in certain cases, to try to speed the birth process.

The companions are always women, either trained in midwifery or simply experienced kinfolk. In 81% of societies a man who is not the husband is not allowed at birth. Of the 186 cultures, we were able to find only two

in which a man actually did something to help deliver the baby. These figures give us some idea of how aberrant is the male-dominated management of childbirth in our hospitals.

Concerning the presence of children (siblings) during birth, the data are very scanty. We could find the presence of children documented in only 11% of societies, while in 25% they were specifically excluded. There is no certainty about the practice in the remainder of the societies.

In 70% of the non-industrial societies the common birth position was with the torso upright. In half of the societies women squatted or kneeled, and in 20% they sat or stood. Only four cultures in the sample used the hands and knees position. Perhaps surprisingly, in a third of the cultures women delivered recumbent or semi-recumbent. However, there is no society in which having the mother's feet in the air is the position of choice.

One of the few human universals is that women are expected to rest after childbirth. Ninety-seven percent of world cultures insist that the mothers rest for an average period of a week. In our own colonial past, women of the community took turns helping the mother for 3 to 4 weeks, so all she had to do was stay in bed and take care of the baby. Thus, the common idea of primitive women slipping off from work to drop their babies quickly and naturally and immediately returning to their usual routine is our own myth, not supported by the anthropological evidence. In non-industrial societies there is often a degree of seclusion of mother and baby during this recuperation period. We may think that this makes sense in terms of protecting the health of the baby and the mother because of their susceptibility to infection. However, in many cultures it is the mother and baby who are considered dangerous to the rest of society. In fact, the word quarantine comes from the tradition of 40 days of isolation of mother and baby after childbirth. In Indian culture the traditional birth assistant is an outcaste woman because only someone so contaminated could possibly handle the dangerous pollution associated

with childbirth.

The existing descriptions of birth allow us to clarify some misconceptions, but they are incomplete. There is often very little about mother, father, other family members, and their response to the baby. There is also little information on postpartum blues, which affects 50 to 85% of women in the United States and England. Even though tearfulness and sad affect are directly observable, the anthropological descriptions are scanty.

EARLY PARENT-INFANT CONTACT. Many of us assume that in the non-industrial world mothers nurse their babies right away, holding them in skin-to-skin contact, suggesting that the immediate separation common in our hospitals is somehow "unnatural." As you know, research on the immediate postpartum period shows increased maternal affection, paternal involvement, and duration of breastfeeding in parents who have had early body contact with their babies. However, almost all research on early contact has been conducted with hospitalized births in industrial populations. Using the anthropological data, we examined traditional births in non-industrial societies to investigate parent-infant body contact in the minutes after birth, and possible differences in later infant care that may be associated with such contact.

In 94% of other societies mother and baby were not immediately in body contact because the neonate and mother were bathed or rubbed. After bathing, in approximately half of the societies, the neonate is placed in the mother's bed, and in the other half the infant is placed in a cradle or basket. Skin-to-skin contact was quite rare since in only 19% was the nude infant placed by the mother. However, in virtually all societies mother and baby spent the next days (averaging a week) together and were not part of the usual daily life.

Are there differences in maternal affection, paternal involvement or breastfeeding duration in societies which vary in providing immediate postpartum body contact? These questions were approached by analyzing numer-

ically coded measures of infant care, such as the identity of caregivers, the response to crying, and the overall quality of infant care. Societies in which the newborn was given to the mother were compared to those in which the baby was placed in a cradle or basket. There was no significant difference between groups on the following measures: the percent of societies in which the mother was the primary caregiver, infant crying receiving a nurturant response, or infants getting generally affectionate care. Thus, measurable differences in maternal affection were not related to immediate postpartum body contact. Please note these analyses compare *societies* with different postpartum practices, rather than *individuals* with different postpartum experiences within the same culture.

Are fathers more involved with their children in non-industrial societies which allow fathers at birth? Numerically coded measures of paternal involvement were dichotomized into closely involved or not, and societies which permitted fathers' presence at birth or those which did not. There was no significant difference in paternal involvement in infancy or early childhood in the 27% of societies which allowed fathers to be present at birth.

Finally, is the duration of breastfeeding longer and are solids introduced later in societies which encourage immediate postpartum suckling? The 40% of societies which nursed within the first hour were compared with the 60% which delayed until after the first day. Infants were not nursed longer and solids were not introduced later in these societies, but it should be noted that breastfeeding lasts two years or longer in 85% of human societies.

DISCUSSION. These anthropological results present a puzzle. Few human cultures emphasize immediate postpartum body contact and suckling, practices associated with longer breastfeeding and increased early maternal involvement for individuals in industrial societies. Yet in non-industrial groups, mothers are

affectionately involved with their infants and breastfeed successfully for two or more years. Understanding these contradictions may be easier if we consider the effect of the early period after birth in the *context* of the subsequent days and months.

In industrial societies the traditional maternity hospital routine of separating mothers and babies has been followed by an infant care pattern characterized by frequent separations of mother and infant in the home, minimal body contact, and spaced artificial feeding. Within the context of this pattern of infant care which separates mothers and infants, body contact immediately after birth may assume disproportionate significance for enhancing maternal affection. In contrast, in non-industrial societies separation in the first hour may have less effect because such brief initial separations are not repeated. Postpartum confinement of mother and baby is universal and is generally followed by extensive mother-infant contact and prolonged and frequent breastfeeding. In addition, little girls' exposure to breastfeeding throughout their lives, the assumption of success, the supportive environment, the frequent nursing, and extensive mother-infant contact are all likely to decrease the importance of nursing in the first hour. Thus, the sensitivity of parents in industrial societies to immediate postpartum contact may reflect disruptive influences of our pattern of infant care and our hospital routines rather than a brief sensitive period for parenting in the human species.

If maternity hospital reform is in fact successful in altering parent-infant relationships, then perhaps families in our society should anticipate new conflicts as this postpartum experience does not fit with the patterns of care during the rest of infancy. Consider breastfeeding as an illustration.

After frequent feeding on demand in the first few days in the hospital, many infants will be eager to eat every 1-2 hours. There is evidence that this feeding pattern may be particularly suited to human physiology. Thoroughgoing

demand breastfeeding is in fact found in most societies, yet in the United States many women find it difficult to sustain and enjoy a "continuous" feeding pattern. In addition, breastfeeding still conflicts with societal expectations. The mother in the United States who integrates breastfeeding with her usual activities may encounter offended righteousness among the public.

Maternity hospital routines which encourage early body contact between mother and baby also seem closer to the pattern of care to which humans may be adapted. In the United States many babies, given the opportunity, seem thoroughly delighted to be in constant body contact in their early months, a desire which may stress some mothers. The woman in the United States generally must provide such contact entirely herself without the help of extended family members who often hold babies while the mother works or rests in other societies. In fact, in cross-cultural studies, the presence of more than one adult caretaker in a household is associated with increased acceptance and indulgence of infants.

If the close involvement encouraged in a family-centered childbirth experience is continued into infancy, both mother and father also may experience conflicts about work. Women's work was previously compatible with infant care; women have worked in most human societies, contributing more than 50% of the food for the group during 99% of human history. Therefore, conflict between work and parenthood seems to be created by the structure of work, in this society. Young children may need to be integrated into the work world before women will function as women at work.

Family-centered changes in maternity hospital practices are certainly needed, but such reform may introduce new dilemmas for parents and infants if not accompanied by transformations in the subsequent pattern of infant care.

Commentary

by Brigitte Jordan, Ph.D.

Dr. Lozoff has raised the question of why, in the course of evolution, the human species has not universally adopted certain beneficial postpartum and child-bearing practices. Cross-culturally, we find physiologically beneficial practices as well as traumatic customs. This generates a paradox since one would assume that over the course of evolution, the human species would have developed the best way to bring a baby into the world and to care for it, in order to maximize its chances for survival. Dr. Lozoff has described the variety of ways that have evolved to do this job.

One way to deal with the paradoxical data we have is to figure that we have inadequate data, and that is certainly the case. Nevertheless, there is enough information on cross-cultural perinatal practices, and enough consistency in that information that we cannot dismiss the case that easily. Secondly, we may postulate that we are looking at the wrong data. The variables we have been looking at, such as skin-to-skin contact, immediate nursing, nonseparation of mother and child, father involvement, and so on, were perceived as marked deficiencies in our own system and for that reason may have drawn attention. So it may be the case that we are dealing with ethnocentric variables which make a difference in this culture but not in others. Finally, I would suggest that the paradox needs to be recast. We need to free ourselves from a narrow biological and adaptive point of view or the postpartum practices which Dr. Lozoff discussed make little sense. They do make sense if you consider the ways in which perinatal customs fit into cultural meaning systems.

What has to be accomplished universally is adequate involvement of caretaker and child, primarily mother and child. Let us conceptualize this involvement as a

progressive mutual engagement of the senses which culminates in the mother "owning" the child, the feeling that this is really *her* baby for which she is prepared to care. We can think then of the progression from first sensory contact, the mother hearing the baby's first cry, first catching sight of it, first holding it, and smelling it, to mutual sensory involvement between mother and baby. The relationship deepens with the mother and baby "talking" to each other, mutual gazing, nipple searching and nipple giving, and so on. It may well be the case that there exists a biologically pre-programmed sensitive period for accomplishing this. But whether a system of this sort is built-in or not, the data suggest that culture is stronger than nature, that different cultures get the job of attachment done in different ways: some during the sensitive period, some later; some with skin-to-skin contact, some without. The important point is that they all do, or babies wouldn't survive.

For a better understanding of our paradoxical data we need to ask cultural questions such as, is the newborn considered a full human being or does it obtain that status by stages? In societies where the latter is the case, mother-infant attachment is likely to occur much later. Naming ceremonies and coming-out ceremonies are usually very good indicators that the child is not considered a full human being at the time of birth; as Dr. Lozoff pointed out, in India the child is not named until the third month.

Another question we need to ask in order to make sense of our recalcitrant data is, how does a particular society value the childbearing woman vis-a-vis the newborn? In traditional societies the focus is almost always on the mother, who is irreplaceable, rather than on the child. Thus many postpartum practices which make little sense when viewed exclusively from the point of view of the baby's welfare, such as dietary restrictions, extended seclusion periods, and various postpartum rituals, do make sense when we consider their value for the physical, emotional, and social recovery of the woman.

Similarly, father involvement with his children is probably much more determined by cultural notions about the father-child relationship than by the father's presence at birth. It may well be the case that whether the husband participates in the birth has more to do with cultural ideas about male-female interaction and the relationship with his wife than with his relationship with the child. In the Yucatan, the Maya Indians believe that the father has to be present and take a very active role during birth, so he can see how the woman suffers; this is expected to keep him from making sexual demands during the postpartum period. I believe that our current emphasis on father involvement is related to women moving into the labor force. This makes joint caretaking necessary, and so all of a sudden we feel that fathers ought to be present at birth and be more involved with child caretaking. That is just one way that our culture and our social expectations of each other shape our perinatal practices. If you want to understand the roots of our behavior it is not sufficient to look only at biological adaptation. We need to take into account the cultural shaping of our biology.

Progress in the Study of Maternal Behavior in Animals

by Jay S. Rosenblatt, Ph.D.

Those of us doing animal research have the privilege of working in the quiet of a laboratory, but we also have the responsibility that our work should bear some relevance to the problems that clinicians encounter. Our work on maternal behavior in animals may be of some use to you in that sense.

Most of my talk today describes the regulation of maternal behavior in the rat. During pregnancy, which is

22 to 23 days in the rat, maternal responsiveness to young gradually increases from mid-pregnancy onward, reaching a high point before the female delivers. The *hormonal* stimulation of maternal behavior is maintained for a very short period, and then it declines. The *maintenance* of maternal behavior is not due to any hormone that we have been able to identify. Postpartum maternal behavior is largely non-hormonal; rather it is stimulated in the female by her contact with her young. It is psychological, in fact.

The onset of hormonal influences occurs shortly after conception, with a gradual increase of blood levels of progesterone secreted by the ovary. This increases until the end of the second trimester, when progesterone declines very rapidly; by the time of birth, there is practically no circulating progesterone. Estrogen, on the other hand, is secreted at very low levels throughout most of the pregnancy. In the last three or four days it increases in its concentration in the blood, reaching a peak a day or so before birth. The other hormone involved is prolactin. There is very little prolactin circulating through most of the pregnancy, but there is a sharp rise just before birth, stimulated by the increase in estrogen.

The onset of maternal behavior is caused largely by the rise in estrogen. The rise occurs before delivery; females presented with foster pups exhibit maternal behavior some 24 hours before they deliver. It makes sense that the female should come into parturition ready to take care of her young; this provides insurance that she will be maternal even before she delivers.

The role of progesterone is very interesting. On the one hand, progesterone inhibits maternal behavior; therefore it is important that it not overlap the rise in estrogen. We also now know that high levels of progesterone throughout most of pregnancy make the estrogen which is secreted at the end much more effective in stimulating maternal behavior than if the progesterone were not there in advance. It appeared first

that it is estrogen that regulates the onset of maternal behavior, but now we believe that progesterone, in turn, regulates estrogen. So in fact there is continuous flow of interaction between estrogen and progesterone occurring throughout pregnancy.

As I have said, the hormonal stimulation of maternal behavior is short-lived. One must, therefore, suggest that there is a transition period during which the regulation of maternal behavior shifts from a hormonal basis to a non-hormonal basis. Because one control system is disappearing and the other is becoming established, that transition period represents a weak point in the system in the sense that there is no single mechanism sustaining maternal behavior.

To learn about that transition period, we took advantage of the fact that we can stimulate maternal behavior in non-pregnant estrous cycling females, simply by giving them young pups. At first they are not very anxious to be close to these pups, but if they are exposed to them for about four days continuously, they will begin to respond, exhibiting nearly all aspects of maternal behavior. Males do the same thing. This induction procedure, often called sensitization, is non-hormonal; if we remove the pituitary gland (therefore preventing any hormones from being secreted in response to the pups) females will become maternal as rapidly as intact females. Thus it is a natural system for a female to have maternal behavior occurring on a non-hormonal basis, although usually it is stimulated by hormones and then perpetuated non-hormonally.

After parturition the presence of pups seems to be necessary to maintain maternal behavior. Females who have raised their own pups show maternal behavior again (sensitization), in about a day, following a 25-day separation. This period of latency is unchanged even if we allow her only 15 minutes of contact after birth, or if we remove every other pup as it is born. Pup contact has enabled her to make a transition so that later she is able to respond to pups. If we allow her to give birth but not to have any

contact with any of her pups, 25 days later she requires four days to be sensitized, the same as a naive female. So hormonal stimulation alone, without the chance to make the transition into the next period, is not enough to perpetuate maternal behavior. Once established on a non-hormonal basis, during parturition, maternal behavior continues to build up in the next days, and can be elicited again even after separation. Parturition is a starting point of the transition between hormonal stimulation of maternal behavior and non-hormonal maintenance of it.

To determine some of the factors that mediate this transition, we looked at why it takes a virgin female four days to become maternal. Our work has suggested that females who have not undergone parturition are afraid of pups at first. Apparently they find them repulsive; when the female sniffs the pups, she almost closes her eyes with this terrible odor that she has had to encounter. To speed up the onset of maternal behavior in virgins, we removed the aversive stimulus. One way is to infuse a substance into the nose which destroys the sensory epithelium temporarily. While the females cannot smell, they exhibit maternal behavior almost immediately upon contacting pups even though they have not gone through parturition at all. Maternal behavior in nonpregnant females is inhibited rather than stimulated by the odors of pups; they have to overcome the inhibition in order to respond to the pups.

Another way to reduce the latency of response in virgin rats is by giving estrogen. Normally a good percentage will become maternal 24 hours after an estrogen treatment. We removed the sense of smell from a group of females treated with estrogen, to determine the combined effect. Sixty-five percent of the females who did not have to smell the pups were maternal nearly immediately. Removing from them the need to smell the pups while being stimulated by estrogen produced a very high frequency of acceptance of the young. When we give females hormones and stimulate their maternal behavior, but

leave olfaction intact, the latency is longer; they still have to overcome their aversion to the pup odors. Our hormone treatment is not sufficient to produce all the normal effects of parturition. Some years ago, it was suggested by Birch that the pregnant female begins to adapt to the pups through contact with her own body odors, principally the birth fluids that leak from the vaginal canal. Since the pups come in contact with the same fluid, her familiarity with those odors and tastes during parturition serves as a bridge to her relationship with her young. It's a very attractive idea, and we are in the process of testing it.

Because we can stimulate maternal behavior without hormones, we can study immature animals that may not be immature with respect to maternal behavior. We investigated when we could first elicit (by sensitization) maternal behavior from rats, the course of maternal behavior during development, and whether males and females differ in these respects. Normally males do not take care of the litter. They do become capable if they're permitted to remain with the female, but she won't permit them. If a male is in the cage, the female keeps him in one corner for four or five days; gradually she releases him from the corner. It takes males four or five days to become maternal upon exposure to pups, so when he is released, he is already maternal. He has been exposed to the odors of pups, so he does not destroy them. He often takes care of them in ways similar to the female.

To look at the earliest manifestations of maternal behavior, we studied animals 20 to 22 days of age, which is prepubertal; they were still suckling from their own mothers. We took them from their litters and presented them with one- or two-day-old pups. In the first 15 minutes they sniff and then lick the pups. As time goes on, they lie down with the pups, and even adopt a nursing position. Both males and females are highly maternal up to 22 days. If you test them on day 24, they show initial exploratory behavior which declines, and they stay away from the pups. So over this short period of time,

something happens to both males and females that makes them shy away. It is a very sharp transition which has appeared in two separate studies now. By the time they reach 30 days of age, still a prepubertal age, females require about six days of exposure to pups before they show maternal behavior. Then they undergo puberty. At the end of puberty, the latency goes down to about four days, and remains at that point for the rest of their lives as far as we can see. On day 30, the males are maternal at about the same latency as the females, but after puberty the male latencies become higher. From then on it either remains at this high level or becomes longer; many males don't exhibit maternal behavior at all. So, puberty produces some effect which differentiates maternal responsiveness of males and females in the direction that females become more responsive, and males become less responsive.

Instead of assuming that this gender difference was entirely genetic and could not be altered, we attempted to find ways of influencing it using sensitization latency as the measure of maternal responsiveness. We removed the ovaries (the source of estrogen) of females before puberty (between 30 and 45 days of age), and those females retained long latencies at 45 days, like the males, instead of having shorter latencies following puberty. Another factor was the olfactory aversion. If we made males anosmic, their latencies were reduced at 45 and 60 days of age; females when anosmic had short latencies at 45 days. Males were nearly as responsive as females when anosmic. Still further, we handled males and females to make them less timid, as has been shown effective in many studies. Handling consists of holding the pups for a few seconds each day from day 22 onward. Latencies were very much shorter in handled females and males: they were almost equal in both sexes at 45 and 60 days.

This indicates that the difference between sexes is not unalterable and is not intrinsic to maternal behavior, but it is a characteristic of postpubertal males which pervades much of their non-maternal behavior. Males are gen-

erally more timid and fearful, which is adaptive in that they are, therefore, more likely to engage in attack behavior. Their main role in this social situation is to attack and protect rather than to nurture, but it invades their response to pups and makes them less suitable to be adequate "mothers." But just a minimum amount of handling and preventing olfaction shows that they are basically capable of maternal behavior if they can overcome their timidity and their aversion to the pup odors.

In species like goat and sheep, where the mother forms a highly individual bond with her own young, we have a problem in the physiological analysis of maternal behavior. If we want to understand the hormonal effect on maternal responsiveness, we should trace that effect in pure form. The fact that the mother develops this highly specific relationship means that we cannot see how long she will be available to respond to young had she not formed that relationship. In other words, in the critical period just after parturition, the hormonal state of the female and her interaction with the young create a bond which is exclusive and, therefore, prevents us from finding out how she responds in general to young. Once she has accepted her own young, she will reject others. This is true of sheep and goats but is not true of the rat.

French investigators Pascal Poindron and Pierre Le Neindre have worked with sheep to analyze the nature of this initial bonding and the physiological basis for maternal responsiveness in general. The hormonal pattern in sheep is similar to that in goats, rats, and most other mammals. During most of pregnancy there is a high level of progesterone which then declines during the last 10 days, a slowly increasing level of estrogen, and subsequently an increase in prolactin. Poindron and Le Neindre tested females throughout pregnancy for maternal behavior, and found that females were maternal at three different points coinciding with rises in estrogen. In a control study, they injected females with estrogen, progesterone, or simply the vehicle for the hormone (control group). During the first six hours, nearly 75%

of estrogen-treated sheep became maternal, while less than 50% became maternal with progesterone. When tested again at 24 hours, more females given estrogen became maternal (85%), while the response from the progesterone group remained the same. They came up with a surprising result, that the control animals who were exposed to newborn lambs but given no hormone treatment, began to show maternal behavior. They found the same phenomena in sheep that we had discovered in rats, that non-pregnant cycling females will exhibit maternal behavior if exposed to the young, but at a slower rate than if they are hormone-treated.

To probe the critical period, Poindron and Le Neindre presented alien newborns to female sheep during the first two hours after giving birth while they were taking care of their own lambs. They accepted the lamb to some extent a half hour after parturition, and continued to accept it but decreasingly up to an hour and a half later. By two hours, they would not accept an alien lamb which was the same age as their own lamb. This is adaptive, in that they remain open to a newborn for the period of time during which they might deliver a second or third young, but they are not prepared to go beyond that into the fourth and fifth young. If females are given older young, 12 hours of age, their acceptance of it declines much more rapidly. So the characteristics of the young play a role in determining the mother's behavior.

We can say that the critical period, for the female to specify her relationship to her young and then to reject young that differ, lasts about two hours. However, the hormonal influences on maternal responsiveness last about 12 hours. If you remove the young at birth and then test the mother periodically for her acceptance of a young which is the same age as her own, 50% of the females are still ready to accept young at four hours postpartum. At 12 hours, it is down to 25% and remains at that. However, with estrogen treatment, acceptance remained at 50% at 12 hours, indicating that the normal decline was due to waning hormonal stimulation. This

means that one can extend the period during which she is receptive with a single injection of estrogen. If you remove the young 24 hours after parturition and then return them 24 hours later, she will accept her own in all cases. The sub-phenomena called the critical period is not a measure of the duration of normal maternal responsiveness at parturition, but is already the product of the interaction of the hormonal state and the stimulation from the young.

To see what lamb characteristics maintain maternal responsiveness and promote attachment to a particular young, Poindron and Le Neindre exposed females to every aspect of the lambs during the first 12 hours post-partum. In one case they allowed the female to nurse, lick and care for the young for 12 hours. In the second case, the female could lick the young, but the young could not nurse. In the third group, the females could neither lick nor nurse them, but the young were beside the female, with varying degrees of separation up to about a yard away. The female got some odor from them. The last group had no contact with the young. They found that nursing or licking was sufficient to maintain maternal responsiveness at a 100% level for 12 hours. However, if one reduces the kinds of stimuli the female receives, she makes some mistakes and accepts an alien young. If one reduces the contact still further, her responsiveness declines and her acceptance of alien young increases. She is still quite responsive but she has been prevented from developing specificity of the maternal bond.

The classic animal for establishing the critical period for maternal bonding is the goat. Research by Klopfer and his associates has shown that if you expose a female to her own young for 5 to 10 minutes at parturition, take her young away, and then test her one hour, two hours, or three hours later with an alien young, she does not accept that alien. She has developed an attachment to her own young, in the first 5 to 10 minutes, making the other one an alien. This research was the basis for the concept of critical period. However, Klopfer's student, Gubernick,

observed that when the young were taken away to be tested with the female later on, they were put with another female. He raised the possibility that they were labeled by that other female, and were identified by the mother as different and therefore not accepted by her. In one experiment Gubernick took the young away but did not allow them to be in contact with another female. The female's response to her own young when they were returned to her was 100% acceptance. When the kids were given to another female in the interim, and they nursed and were licked by that female, their mother would not accept them. So the mother is still available to respond to young, but she does not respond to a young that has the mark of another female.

The female may mark the young either by licking them, nursing them, or by the young being in the vicinity of the female. Gubernick developed an apparatus that prevented the females from nursing or licking the young, and so he was able to separate the marking effects of licking, nursing, and proximity. He found that nursing, in part, marks the young as alien. Licking, and even being in contact, without being licked, also marks them so they are not acceptable to another female. On the other hand, if presented with an alien kid immediately after parturition, the female will accept that kid after a separation of up to three hours. Klopfer had shown that the first few minutes after birth are crucial for the establishment of these individual bonds in the goat.

Finally, I want to point out that our own species is perhaps not so different from these species. If you look at the hormonal picture in humans, serial samples over the last 24 or 25 weeks of pregnancy give a curve resembling that which we see in rats, sheep, and goats. There is a rise in progesterone, then a decline, and a rise in estrogen. If the curves are lined up with respect to when parturition begins, it appears very clearly that sometime about three or four weeks before a woman delivers, she is actually undergoing the changes which in other species induce maternal behavior.

The Physiologic Effects of a Supportive Companion (Doula) During Labor

by John H. Kennell, M.D.

As a result of the remarkable advances in pediatrics and obstetrics in the last 50 years, many more babies and mothers survive today, but we are faced with increasing unrest about childbirth and child-rearing practices. Physicians and nurses trained when I was, almost four decades ago, have seen much of our training proven completely incorrect. For example, we remember revolutionary changes in our view of the needs of children. In the late 1920s, John Watson advocated a rigid approach to child rearing, suggesting strict schedules for feeding, toileting and almost every other activity including loving. He advised mothers not to kiss their children because kissing interferes with digestion and deranges the glandular system.

Similarly, views about childbirth are changing rapidly. We are just beginning to look critically at what we are doing, and we're finding that the justification for many obstetric and pediatric practices rests on insufficient evidence.

When we went to Guatemala to carry out studies on mother-infant contact we spent many days and nights on obstetric divisions in two exceedingly busy hospitals. Fifty to sixty babies were delivered every day in each of these hospitals, using routines established by doctors and nurses from the United States. Hospital policies did not permit any family member or friend to be present in the labor and delivery rooms. The cries of mothers and their appeals for help and relief in the labor and delivery division brought back memories of children crying on pediatric divisions prior to unlimited parental visiting, and observations of women in labor in the United States before husbands were allowed to be present during labor and delivery.

In a pilot study in 1976, we asked an untrained woman to stay with a mother during her labor and delivery. There were dramatic changes in the women during labor. They became quiet and peaceful. We noted that several had milk dripping from their nipples when their baby was brought to them after delivery, which we had not seen previously among some 150 women laboring and delivering alone.

Consistency of care throughout the perinatal period is an important tradition in the rural areas of many developing nations. In all but one of 150 human cultures studied by anthropologists, a family member or friend, usually a woman, remained with a mother during labor and delivery. In 98% of cultures there is a tradition of postpartum confinement of the mother and baby together. Also in this country it was the practice for family members to support the mother actively in labor, often with a trained or untrained midwife. Although more fathers, relatives, and friends have been allowed into labor and delivery rooms in the past ten years, many women still labor and deliver in some hospitals without companionship. There has been little systematic study of this issue since the Newtons reported that mothers who were quiet and relaxed during labor and delivery were more pleased at the first sight of their babies.

We then investigated in Guatemala the effects of a supportive companion (Dana Raphael termed such a person a "doula") on the length of labor and on mother-infant interaction after delivery. In this hospital mothers routinely labored alone, and no electronic monitoring was used. In addition to the routine care, women in the experimental group received constant support from an untrained lay woman from admission to delivery. The pairs had not met each other previously. The support consisted of physical contact (for example, rubbing the woman's back and holding her hands) and conversation. The control group followed hospital routines.

Primigravid mothers in early labor (cervical dilatation of 1 to 2 cm), with no known preeclampsia or other

medical problems, were eligible for the study. Women were asked to participate in the study on arrival at the hospital; assignment to groups was random. A woman was removed from the study if labor was false or prolonged, or if there were problems with the infant (asphyxiation, meconium staining, depression, respiratory distress, or stillbirth). Cesarean births were also excluded. Women were enrolled in the study until there were 20 in each group.

Mothers in both groups were allowed 45 minutes of skin-to-skin contact with the undressed infant in a private room. An observer who did not know the previous experience of the mother watched through a one-way window for 15 seconds at 45-second intervals.

It was necessary to admit 103 mothers to the control group and 33 to the experimental group to obtain the final samples of 20 in each group with uncomplicated labors and normal vaginal deliveries. In other words, 83 women assigned to the control group and 13 assigned to the experimental group were excluded because they developed one or more of the problems mentioned. There was a significant association between the presence of a supportive companion and a lower incidence of problems of labor, delivery, or the neonate. The mean time from admission until delivery was 19.3 hours for the control group and 8.7 hours for the experimental group ($p < 0.001$).

During the period of postpartum contact, there were differences in maternal state and behavior. Mothers in the experimental group remained awake longer than did those in the control group. While the women were awake, there was a substantial difference in the amount of stroking, talking, and smiling, with the experimental mothers exhibiting more of these behaviors towards their babies.

The findings of this study strongly suggest the importance of companionship during labor and delivery. Labor was shortened and some aspects of maternal behavior in the first hour after delivery were enhanced.

The likelihood of certain problems developing during labor and delivery was lower for mothers who had a supportive companion.

In a second doula study in progress in Guatemala we continue to find a striking difference in the incidence of problems. In this new study it has been necessary to eliminate 104 mothers from the control group because of complications in contrast to 31 from the doula group, a three-fold difference.

Our findings suggest an association between acute anxiety and arrests of labor and fetal distress. Studies of human and primate mothers have suggested that one mechanism to account for this relationship is increased catecholamine levels. Lederman found that *plasma* epinephrine levels and self-reported anxiety at the onset of phase 2 of labor were significantly correlated in 32 normal primigravid women. Physiologic elevations of plasma epinephrine were associated with decreased uterine contractile activity at the onset of labor (3 cm of cervical dilatation) and a longer duration from 3 to 10 cm of cervical dilatation. Barton noted marked reductions in blood flow (up to 50%) to the sheep uterus with an injection of epinephrine and norepinephrine. Catecholamines administered to pregnant rhesus monkeys (Adamsons) resulted in fetal asphyxia but led to no such effect when injected only into the fetus. Meyer noted that psychological stress alone without pain or physical contact with the pregnant monkey resulted in fetal asphyxia. Therefore, we can hypothesize that the supportive companion in the present study reduced catecholamine levels, facilitating uterine contractile activity and uterine blood flow.

Our findings are particularly relevant to the care of mothers where positive family support may not be provided during labor and delivery, and where there may be no cultural preparation for childbirth. McAnarney et al. showed that consistent and abundant human support for teenage mothers resulted in no more obstetric or neonatal complications than in older mothers, in spite of

evidence to the contrary from several previous studies. An untrained woman provided the friendly support in our study, but similar or greater benefits might be expected when a family member or a friend remains with the woman through the labor and delivery. The doula is a low cost intervention that may be a simple way to reduce the length of labor and the number of perinatal problems.

In conclusion, let me note that if I had told you today about a new medication or a new electronic device that would reduce problems of fetal asphyxia and the progress of labor by two-thirds, cut labor length by one-half, and enhance mother-infant interaction after delivery, I expect that there would be a stampede to obtain this new medication or device in every obstetric unit in the United States, *no matter what the cost*. Just because the supportive companion makes good common sense does not decrease its importance. The supportive companion is safe. There is no electrical hazard. No purchase order is required. There is no need for approval from regional planning boards, health planning commissions, or budget offices. There are no long waits for FDA approval, no long delays for repairs. We can institute this immediately for every mother. However, there is a real hazard that the supportive companion will be considered unscientific and less important than medical interventions, because it does not fit the medical model of care. Until we begin to insist on it, it may not be provided for all mothers in all hospitals.

The Milieu and Obstetrical Positions During Labor: A New Approach from France

by Michel Odent, M.D.

We are in a public hospital 60 km to the south of Paris. In our district people have no choice of hospital, so

many of the people come to us for geographical reasons. Among them there are many kinds of people and every social level is equally represented. I must emphasize that among them there are immigrants, especially Portuguese, North African, American, and Turkish. There is only one hospital in Pithiviers for maternity, thus our patients represent the whole population of the area.

In the hospital there are long and large corridors so that you can meet women or couples walking, especially during the first strains of labor. You notice a large meeting room with a piano, and around the corridor you see two small swimming pools. And then we reach the birth rooms, and at once you can notice that there are two kinds of birth rooms. First there is a classical birth room. Then there is another kind of birth room, where the color of the walls, curtains, cushions, and the rug are all considered important. It's a place where no equipment, no furniture can suggest or induce posture. You know that when delivery happens in a hospital, there is a table, which means a lying-down position. You know, that when delivery happens at home, it's usually in a bedroom where there is a bed. That means also a docile position. So we think it is important that there is just a very large platform, nothing which can induce a certain posture.

I will try to summarize what we have learned these last four or five years, since this second room was organized. Of course, even in such a place sometimes the delivery happens on the back. You know that the lying down position has been usual in the last three centuries, having been introduced in the 17th century when the male doctor entered the confinement bedroom. We observe that even if the woman knows that she is free with her body, some deliveries happen on the back.

I must say that these last years we understood better and better how to help the would-be mother to become more instinctual, to follow her feelings. We try to help her to change her conscious level so that the labor seems

to be easier, and to help the would-be mother to find out about all the postures. I try to be aware of some main factors which in our view can induce a kind of positive regression, this change of level of consciousness. Of course, it is the whole atmosphere which can encourage this level of consciousness, and it is difficult to describe. However, there are some important points that it is possible to discuss.

It seems important in our view to give the couples as many chances as possible to visit the maternity unit in the hospital before delivery. There are groups where people can talk together, people expecting a baby and people who have had a baby before, so they can talk about the pleasures, the joys, and not just about the fears.

Another point is the importance of assistance by a woman, the importance of the midwife. In our team there are six midwives and myself. We have reasons to think, looking at history, that the midwife is perhaps somebody like a substitute for the laboring woman's mother. But not any woman can be an effective midwife. She must be a woman who is able to effectively bring love, and who can be felt in the experience as supportive as a mother. We sometimes feel that the presence of the male is negative. Of course, it's not so simple. Nobody is just a man, nobody just a woman. But sometimes I have the feeling that I had better not be present during a delivery. Of course, there is the father, who is at the same time a male and also a familiar person. So it's not so simple. Between the two women there is the skin-to-skin contact, rather than the verbal communication. If the midwife has to talk, she will use simple words, words that might be understood by a baby, rather than an elaborative language. I would like to emphasize another point. We are reducing all the sensory stimulation in birth rooms with semi-darkness, as well as silence, as if the woman in labor will need to be in a quiet place far from other people, without people watching her.

Some postures many women can find by themselves, such as squatting, and also on the knees, bending

forward during the contractions. Many women search for a posture to reduce the pain and find this kneeling position. From a mechanical point of view, we have learned that it is a good posture to help the rotation of the baby's head inside the pelvis. But we also observe that when a woman has been using this posture for some time she becomes different; she's on a different planet. She has turned the level of consciousness. She has reduced the pain. She has reached a change of conscious level which belongs to the physiology of the delivery and is possibly connected with another hormonal equilibrium. There is a time when many women need to feel that there is some help near them and especially somebody who can support the shoulders. We observe that many women need at some time to flex the knees so that they are in a kind of supported, squatting position with one or two people at her side helping her; this scene is quite common in our maternity unit now.

We do not tell mothers that there is a good posture. Everything is possible. Some women deliver on the back, others in an old fashioned obstetric chair. However, there is a posture, the supported squatting position, which gives a higher pressure in the pelvis. This allows the best relaxation of the perineal muscles. So that when it might be difficult or when it might be dangerous in our view, this posture is imperative, and especially when it is a breech delivery. You know when it is a breech delivery what is dangerous is the delay between the delivery of the umbilicus and the delivery of the baby's head. This delay is artificially created or reinforced by the dorsal position of the mother. When the mother is in a supported squatting position, as soon as a breech is delivered, the whole body comes so there are no more dangers connected with a breech position.

Water is another factor which you can point to in our view to help the would-be mother during the first stage. The efficacy of water during the first stage is mysterious. Sometimes just a shower is sufficient to relieve an inhibi-

tion. Sometimes there are inhibitions that we cannot interpret; sometimes an arrested labor begins again and we don't always understand what has happened. We observe many times that a good bath in warm water with semi-darkness is the best way to reach a high level of relaxation, and it can be used by many women without any preparation, without any class. When a woman is in a bath, in a pool, the contractions become much more efficient so that sometimes labor is very quick. Many women don't want to leave the water because it is so comfortable. The importance of water is first to help the would-be mother during the first stage. It's one factor among others to help her to become instinctive, to listen to the primitive brain, to reach another level of consciousness. The efficacy of water is mysterious, but there are many languages to try to explain. We might say that warm water is a good way to reduce the tension. Others would say that water is a symbol of mother, and perhaps we are again talking about the would-be mother who needs to be in contact with her own mother and her substitute mother (midwife) during labor. There are many ways to understand the efficacy of water.

When the baby is born, the baby is put between the mother's legs, in a safe position on its belly, looking on the side, a position which can protect the respiratory tract. It is put in this position just a few seconds, just enough to check that the baby is shouting, and breathing, that everything is all right. Some seconds later, the mother wants to take the baby in her arms. When we put the baby on the body of the recumbent mother, the contact between mother and baby at the time of birth is different than when the woman is vertical. Our goal is skin-to-skin contact, eye-to-eye contact. You can imagine that the first and lasting stimulation of the baby is different depending on the mother's position. There is a lot to say about what happens at this moment, and it is a temptation to come back to the concept of level of consciousness. The change of level of consciousness will help the delivery to be easier. We believe this change

is also important after the baby is born. This kind of instinctive state of mind is the best way to help a mother to know what to do with her baby. Some seconds after the baby is born, mother and baby are discovering each other. Some minutes later, the baby is sucking at the breast.

The semi-darkness which is so important to help the woman in labor is also important at the time of the first contact between mother and baby. While the woman is vertical, she is active. Even when the cord is not yet cut, the mother is giving the baby a bath by herself. Of course, the meaning of the bath in our practice is not the same as it was some years before, when the mother was more often lying down and other people were caring for the baby. Often it was a problem to have the first bath in the presence of the father. It looks more and more different now when the mother is active. It's a good way to show another dimension of the questioning of obstetric postures in a society where the concepts of femininity and passivity are commonly associated.

Of our last 2,000 deliveries, we have had a low rate of cesarean, 7%, and a perinatal mortality rate of 11 births per 1,000. We have a high number of women who had a previous cesarean and will come especially to our hospital to have as much chance as possible to deliver by the vaginal route. We have had 31 vaginal deliveries after a previous cesarean section. Our rate of episiotomy is only 7.1%. What is important in our view is that the squatting position gives an optimum stretch of the perineal muscles, and it is the best way to prevent dangerous tears. Actually, we have never observed dangerous tears after a delivery in the squatting position.

In summary, what we try to do at Pithiviers is to rehabilitate the instinctive brain, the emotional brain, the brain which is close to the body, in a world that generally just knows and takes into account the other brain, the rational brain.

Commentary

by Dora Henschel

Introduction by Michel Odent, M.D.

Dora Henschel is the Senior Midwifery Tutor at King's College Hospital in London. She has a good knowledge of our practice because she visited us several times, first in 1976, spending several days and nights among us, among the midwives. She came back in 1979 and 1980. I think that as an experienced midwife, Dora can give you another view of what has been the main evolution, the main changes during this last year at Pithiviers.

Commentary

I am very pleased to be able to add a little bit to Michel Odent's story of Pithiviers. I am very fortunate to have been there in 1976, to see Pithiviers before it actually had changed to what it is today. But I am not at all surprised that it has changed.

I would like to say a little bit more about how this unit is run. Michel Odent has already told you that he runs the unit, which is in a public hospital with 19 obstetric beds and six midwives. The six midwives work 48 hours at a stretch, two of them at a time; this gives added continuity of care. They have a bed in one of the offices so it is possible for one of them to lie down when the unit is not busy. There is one other grade of staff in the units, the aides, who wash the floors, give out the meals, help the mothers with their babies, show them how to bathe their babies, and help with breastfeeding. These three grades of staff, Dr. Odent, the midwives, and aides work very closely together. They all know what the other person does. There is no conflict. You don't have the sort of thing we have in England, and perhaps you have in America, that one set of nurses or doctors goes off duty, and the next group has quite different ideas about the treatment of the mother. There everybody works together. The one thing that struck me particularly was that all these grades of staff, and the mothers and the

babies, and the fathers, are in fact equal. In England we have a grade hierarchy. There's a consultant up there and he would never dream to say good morning to the domestic, but not so in Pithiviers. There, everybody is important.

I'd like to describe the first delivery I saw at Pithiviers. The woman was Portuguese and expecting her second baby. She came alone. When the mother is admitted, she is not shaved, she does not have an enema, and she is admitted into the room where she will be after the delivery. There may be another mother already in the room.

The care in labor is shared by everybody. The doctor, the midwives, the aides, and perhaps other patients might support the mother during her labor. The mother walks about, lies in bed or sits in the rocking chair, whatever she likes to do. Today walking is perhaps more encouraged than it was when I first visited. When the cervix was dilated 8 to 9 centimeters, the mother walked to the labor ward.

In the labor ward, the blind was drawn so there was subdued afternoon light. The mother climbed onto an ordinary delivery bed. This can be divided into three sections. The upper third of the bed can be raised so that the mother can sit up and the lower section is wheeled away, once the mother uses leg supports in the second stage of labor. The mother came to the second stage very quickly. As she started to push, the midwife showed her the progress of the head using a mirror. I was somewhat amazed to find the midwife at the side of the bed. She was talking to the mother very quietly, occasionally listening to the fetal heart. I was standing there with my mouth open because I thought this baby was going to fall out or there was going to be a tear. But no such thing happened. The only thing the midwife said was, do some more, do some more, there, we are all done. The head was born and the perineum just gave; I really couldn't believe my eyes.

In the meantime, it had been very quiet. I asked how

did the mother feel about this atmosphere, and she said, it was like a church. This was quite a different experience for her than her first baby. Then the midwife came around and gently lifted the baby up into the mother's arms. The mother gave a shout of joy but there was not a cry from the baby. That was another shock to me because I was used to babies shouting their heads off. Despite the subdued light, you could see that the baby was lovely and pink. It opened its eyes very soon, looked around for the nipple and found it very quickly. I was amazed. The woman had had no drugs, nothing to make the uterus contract as we give in England, and there had been no drugs in labor. No mothers get any drugs in labor at Pithiviers. When the cord was cleansed and seen to, the midwife handed the baby to the aide who dressed it. When the mother had pushed out the placenta, the midwife cleaned up the mother, and then I had another shock. The mother had asked to get off the bed. She was given the baby and she walked back to her room. I saw four more births after that, and they were all very similar.

I am not surprised that in Pithiviers things have changed since my first visit because some mothers wanted something different. In other places many mothers tell the doctor, I want this, that and something else in labor, and have to fight for what they want. There's no confrontation at all in Pithiviers. The mother is free to do what she wants, and as a result of that, the unit has developed in the way that Odent has described. I am not sure how much further it can possibly develop, but one thing is quite certain, something very special is happening there.

I would like to tell you a story about a young English girl who went to Pithiviers to have her baby. Although she desperately wanted to welcome her baby, she was one of the few mothers who had to have a cesarean section. She was an unmarried mother, and everybody made her feel very special at Pithiviers. She thought she was the only one there that really mattered. A few days after she

had the baby and had lived in the hospital, she suddenly realized she wasn't special at all. Everybody is special and I think this is the secret of Pithiviers.

One cannot change a unit from one day to the next. It is very important to realize that the team at Pithiviers has worked together over many years. They are clinically very experienced and can judge when the mother needs help or whether she can go on with a long labor. In our hospital, there are a large number of midwives, students, and junior doctors, who change over all the time, who have different opinions and different techniques. I feel very strongly that one has to grow into this and has to form a team to reliably work together. Only with a unified approach can we help make sure that things don't go wrong. Although in my practice in England I cannot always follow the lead of Pithiviers, my visits there have forced me to question and change my beliefs about the way we work in maternity, beliefs I have held for over 20 years of practice as a midwife.

PART TWO
ATTACHMENT:
PARENT $\longleftrightarrow$ *INFANT*

Early Caregiving and Later Patterns of Attachment

by Mary D. Salter Ainsworth, Ph.D.

The findings I shall present stem from a naturalistic study of mother-infant interaction throughout the first year of life, with particular attention to the development of infant-mother attachment. The sample consisted of 26 white, middle-class mother-infant pairs from intact homes in the Baltimore area. Six of 26 infants were first-born; 16 were boys and 10 were girls. The study began in 1963, at which time none of the hospitals involved provided for immediate postpartum contact; none of the dyads roomed in together.

Visits were made to the home at three-week intervals from three to 54 weeks after the baby's birth, each visit lasting about four hours. We observed and recorded what the baby did, especially in interaction with other people, what the mother did and said, and what all other persons present did and said relevant to the baby. In addition at 51 weeks we brought mother and baby into the University for a controlled laboratory situation that we called the strange situation.

STRANGE SITUATION CLASSIFICATION. The results of our laboratory strange situation served to highlight individual differences in the qualitative nature of an infant's attachment to his mother.

This session was composed of eight episodes: a brief introductory episode, followed by two preseparation episodes, one with mother and child alone in a room with an array of toys, followed by an episode in which a stranger was present also. Then came a separation episode in which the baby and the stranger were alone together, followed by a reunion episode with the mother. Then came another separation, in which the baby was left entirely alone, and then the stranger returned. Finally the mother returned a second time. We found that the child's behavior in the two reunion episodes gave the

best indication of the nature of the infant-mother attachment.

We identified three main patterns of attachment. At first we labeled these as Patterns A, B, and C, not yet wishing to interpret the differences between them. These labels have stuck throughout a large number of replications of this procedure by others.

In white, middle-class American samples, about two-thirds of the babies fit into Pattern B. These babies may be characterized as *securely* attached to their mothers. When their mothers returned from brief separations in this unfamiliar environment, they sought to be close, and if picked up they tended to resist being put down again too soon.

Babies displaying Patterns A and C were both identified as being anxiously attached to their mothers. Pattern C babies tended to behave anxiously throughout the strange situation, even in the preseparation episodes, and to be acutely distressed in the separation episodes. In the reunion episodes they obviously wanted to be close to their mothers, but their reactions to her were ambivalent, even angry. Hence, we called Pattern C babies *anxious/ambivalent* in their attachment to the mother. They were least numerous in all the middle-class samples so far studied, accounting for less than 10%.

Babies displaying Pattern A behavior accounted for about 20-25%. They seemed not to be disturbed by separation from the mother. When she returned they tended to avoid her, either steadfastly ignoring her, or mingling avoidance with proximity-seeking behavior. Because of this reunion behavior we have labeled them as *anxious/avoidant*.

MATERNAL BEHAVIOR RELEVANT TO FEEDING. To examine the feeding situation in the home, we rated the extent to which the mother showed sensitive responsiveness to the baby's signals, pacing, and preferences, either gearing her behavior to his, or herself dominating his transactions. We looked at initiation and termination of feeding, rate of intake, and

introduction of solid foods.

The mothers whose ratings were low for responsiveness in the first quarter of the year had babies whose feedings could only be characterized as unhappy not only in the first quarter, but in the fourth quarter as well. In contrast, babies classified as securely attached to their mothers at 12 months had mothers who had been the most sensitive to infant signals relevant to feeding during the first quarter year.

MATERNAL RESPONSIVENESS TO INFANT CRYING. We coded infant crying, including fussing, during our home visits through the first year. Two measures of maternal unresponsiveness to crying were number of crying episodes that were totally ignored by the mother, and the duration of her unresponsiveness. Similarly two measures of infant crying were frequency of crying episodes, and duration of crying.

We found that the amount an infant cried during the first quarter had no correlation whatsoever with how much he cried in later quarters. However, the degree of maternal responsiveness to crying did tend to be consistent throughout the first year. The most interesting finding was that mothers who were relatively unresponsive to crying in any one quarter had babies who cried relatively *more* later on. There was no support whatsoever for the belief that responsiveness to crying results in the baby learning to cry more. Furthermore, the *appropriateness* of the response to crying had no long-term effect; to respond, and to respond promptly was more effective in long-term reduction of crying than responding appropriately.

What does the baby learn when his mother responds promptly to his cries? It seemed to us that he might well learn to trust his mother, and expect her to be responsive to him. Thus he should become secure in his attachment to her. In fact, mothers of Pattern B babies responded more quickly to their crying, than did the mothers of the anxiously-attached babies of Patterns A and C.

MATERNAL BEHAVIOR IN FACE-TO-FACE SITUATIONS. From six to 15 weeks of age, positive infant behaviors such as vocalizing, smiling and bouncing were associated with playful and contingent maternal behavior. On the other hand, mothers who initiated interactions silently or who sustained a matter-of-fact expression while *en face* had babies who tended merely to look at them.

Babies who were anxiously attached by the end of the first year had tended in the first quarter to fail to respond to maternal initiations of face-to-face interaction and/or to terminate it once it had begun. Their mothers tended to be those who maintained an unexpressive manner when *en face*. The mothers whose babies became securely attached were conspicuous for contingent pacing of their behavior in face-to-face interaction.

BEHAVIOR IN EVERYDAY SEPARATION AND REUNION SITUATIONS. We coded the child's behavior each time the mother left the room and on her return. Relatively frequent separation protest at one year was associated with mother's unresponsiveness to crying and general insensitivity to infant signals. We have evidence to suggest that once separation protest has become part of the baby's behavioral repertoire, it is the cardinal sign of anxiety in his relationship with his mother. To be sure, separation protest can be taken as a criterion of attachment, but very frequent protest in little everyday separations became an indication not of strength of attachment but of anxious attachment in this sample. The babies who avoided their mothers in the reunion episodes in the lab were more likely than the securely attached babies to protest separation at home, even though they had not in the lab.

Mothers of securely attached babies acknowledged the baby upon entering the room more consistently than mothers whose babies were anxiously attached. Mothers who were promptly responsive to infant crying, and who had been rated as accepting and cooperative tended to have babies who responded to their return after a brief

absence with a positive greeting—smiling, vocalizing reaching, approaching—rather than greeting them with a cry.

MATERNAL BEHAVIOR RELEVANT TO CLOSE BODILY CONTACT. We coded every time the baby was picked up and coded the amount of holding (frequency and duration) as well as the *qualitative* nature of the bodily contact.

We also coded infant responses to being picked up, held, and to being put down, and active initiations of being picked up and put down. One could not predict how a baby would behave in later quarters from the way he responded to close bodily contact in the first quarter, whereas maternal behavior tended to be quite consistent throughout the baby's first year.

In each quarter, tender/careful, affectionate, and playful maternal behavior were toward one end of the qualitative dimension and inept holding and interfering pick-ups toward the other. Picking the baby up often was associated with inept and interfering behavior. Mothers who picked their babies up especially often tended also to put them down again quickly, before a crying baby could be soothed.

In each quarter positive infant responses, both to being picked up and to being put down, were associated not with how long they were held but with how the mother held them, and especially with holding of tender, careful quality. Negative responses to being picked up and put down were associated with inept holding, with frequent pick-ups, and later with interfering pick-ups.

Tender, careful holding in any one quarter significantly influenced positive infant response to being held in later quarters, whereas the reverse was not the case. On the other hand, from the second quarter on, positive infant response to holding did increase maternal affectionate behavior whereas the reverse was not the case. These two findings together suggest a "virtuous" spiral. Mothers who are tender and careful early on, gearing their behavior to the baby's cues, tend to evoke a positive

response in the baby, which carries over into later quarters. This positive response evokes maternal affectionate behavior, which in turn reinforces positive infant response, and so on. First-quarter maternal ineptness seemed to begin a vicious spiral; it was associated with infant negative response to holding later on, but from the second quarter on there was as much evidence for infant negative response being the cause of maternal ineptness as for its being the effect.

The relationship between maternal holding and the eventual nature of the infant's attachment turned out to be quite complex and highly significant. Pattern B (securely attached) and Pattern C (anxious/resistant) infants responded more positively than Pattern A babies both to close bodily contact and to its cessation. During the fourth quarter, the anxious/avoidant Pattern A babies almost never "sank in," molding their bodies to the mother's body when held. Mothers who in the first quarter were relatively tender and careful when holding their babies had babies who were securely attached to them at one year, while those who handled the baby ineptly tended to have anxiously attached babies later on. More striking, the mothers of the anxious/avoidant babies *all* showed a marked aversion to close bodily contact, whereas none of the mothers of the Pattern C or B babies did. Thus, although they did not hold their babies for less time, somehow, we believe, they expressed rebuff often enough when their babies sought close contact that this had a profound influence on the infants.

Mothers of Pattern A babies also tended to be unexpressive emotionally with their babies. Indeed it was my clinical impression that they were all compulsive; furthermore they all seemed more rejecting than other mothers in the sample, having their positive feelings for their babies more often overwhelmed by irritation, resentment, and anger than the other mothers. Babies of these mothers were more angry themselves than the other babies.

INTERPRETATION OF FINDINGS. There seems no

doubt that the main feature of a mother's behavior that is associated with her baby's secure attachment to her is her sensitive responsiveness to his signals and communications. Indeed, all the things that might be considered positive maternal behavior were highly correlated with one another, and associated with secure infant-mother attachment.

The second main facet of maternal behavior concerns close bodily contact with the baby; this was particularly significant in distinguishing between our two patterns of anxious infant attachment. We are inclined to believe that early interaction relevant to contact may shape patterns between child and mother that persist long after contact itself is less frequently important than it is early on. In our view it makes sense that the mother's response to a demand for contact is so important, because when attachment behavior is activated at high intensity, mere proximity is not enough; only close contact will do.

PREDICTIVE IMPLICATIONS OF PATTERNS OF INFANT-MOTHER ATTACHMENT. Although my own work with this sample of mother-infant dyads came to an end soon after the babies' first birthday, other researchers have established continuities between these three attachment patterns and a child's behavior in other situations a year, two years, three years, and in one study five years later. Most of these congruencies deal with the child's later relations with others — with his mother, with other adults, with peers — but some of them link attachment pattern to exploratory behavior, language development, problem solving, and other facets of cognitive development.

Although these prospective studies imply substantial continuity in development, they do not altogether clarify its basis. Is it that early patterns of responding to things and to people tend to persist, or does the child's continuity depend on continuity of his mother's behavior with him as he grows up? I think both of these play a part in making for continuity. Although the inner organization, outwardly manifested in patterns of behavior, tends

to resist reorganization and change, nevertheless change can and often does occur. Although most of the mothers in my sample showed remarkable continuity in their behavior toward the baby, a few changed substantially, in response apparently to changes in the conditions of their lives. In each case the babies responded to the change, for better or for worse, and the baby's attachment to his mother seemed to reflect something of both kinds of experience. Furthermore, one of the test-retest studies (Vaughn et al.) found less stability of attachment pattern from 12 to 18 months with a low socio-economic group than with the middle-class groups that have usually been studied. The implications were that the low socio-economic status (SES) mothers were under more stress from their life circumstances, stress that might well increase or decrease in the course of the study. Repeated strange-situation assessments showed some changes in infant attachment pattern, related to changes in the stress impinging on the mother. Even with this sample, however, stability of pattern was far from insignificant.

IMPLICATIONS FOR THE BONDING OF MOTHER TO INFANT. Although we did not assess the mother's bond to the baby, it seemed that none of the mothers in our sample altogether lacked a bond to her baby. Even the mothers of Pattern A, anxious/avoidant babies, seemed to have loving feelings toward the baby, even though they were more often overwhelmed by irritation and resentment than other mothers.

How can one judge whether a mother has become bonded to her baby? Criteria that have been suggested in the literature seem similar to the characteristics of the behavior of mothers of Pattern B babies. It may be that immediate postpartum contact with the baby favors bonding by facilitating sensitive maternal responsiveness to infant signals, thus facilitating maternal behavior which helps the baby become securely attached. It would be particularly interesting to know whether such early contact helps the mother to welcome close bodily contact with her baby, perhaps preventing the kind of aversive

response associated with the anxious/avoidant pattern of attachment on the part of the infant.

I believe we would all agree that the vast majority of mothers, including adoptive mothers, become bonded to their babies. And I am sure we would all agree that it is highly desirable to research conditions that facilitate this process, especially, to identify various patterns of attachment of mother to baby that may influence maternal-care behavior and hence infant socio-emotional development.

Mothers and Infants: The Early Transmission of Affect

by Daniel Stern, M.D.

I approach this conference as one of those baby and mother watchers who observes the social and emotional interactions through the first year of life. I would like to speculate about what we mean by a relationship between the mother and the baby, from the infant's point of view. Obviously this can't really be done, but I expect that the exercise may be constructive in the way we think about certain things.

First, I want to make a very important distinction between an interaction and a relationship. An interaction is an isolated event, while a relationship has continuity over time, a history which is cumulative, and involves some kind of "specialness" between the individuals involved. In the last decade or so as you all know there has been a massive explosion of information about the newborn as a competent person. We have looked at the infant's concept of language, the way he learns, and his knowledge of space, time and causality. But we haven't yet asked the same question about the baby's concept of self and of a relationship with another. In order to have a relationship with somebody, there has to be some primitive distinction between self and others. I propose

that the infant probably has a notion of self and other, as an emergent property of the baby's perceptual systems.

Assuming the baby can tell self from others, we can proceed to the issue of how the baby might conceive of different forms of being with another person. The traditional view is that the newborn exists in an undifferentiated state where the baby cannot tell "I" from "not I." The baby does not know really who is the agent of things that happen, and there is general confusion between inside and outside. Most people seem to agree that there is a long period of nondifferentiation. The timetable for this in the literature is thought to be around eight months or so, coming to an end with the onset of stranger anxiety, when the baby recognizes himself as different from the mother. This view assumes that the baby does not have any sort of innate perceptual propensities that would lead him to know the difference between self and somebody else early on. The corollary is that the baby learns by slowly piecing together a picture of who he is and who somebody else is. Another corollary is that babies are mainly passive learners, a variant of the *tabula rasa* view of the baby. It is also assumed that the baby does not have the memory capability until about eight months to retain the picture of somebody else, to form a consistent image of another person or himself. Another assumption is that interactions between people are more salient for the infant in the very beginning than the people themselves. This is an important point, one that I will get back to. Now, let me critique these assumptions very briefly.

The first assumption is that the baby is not prepared to tell the difference between himself and others in the beginning and that he is a random and passive learner. The Bornstein experiments are a very good demonstration of the infant's ability to perceive and distinguish inanimate things. Bornstein probed whether the baby knows the difference between color categories, at birth, or whether he learns them. It turns out that a perceptual bias is present very early, so that infants discriminate

color boundaries in much the same way adults do. If you show them two different blues that are a certain number of wavelengths apart, they will not respond differentially to them. But if you cross over to the green, the exact same number of wavelengths away but into a green category, they will respond differentially to the new color. In other words, they do not have to learn this discrimination process. We know from some of Brazelton's work that babies have the same kind of innate perceptual bias to discriminate animate from inanimate objects, things from people. I think it will become apparent at this conference that there are built-in sensory motor patterns uniquely designed to facilitate interaction with another person. So if the infant is predesigned to perceive from very early on in life and to recognize natural categories of objects and events that are important to humans, why should he not also be able to perceive categories of self and others, which are clearly very important natural categories?

What kind of equipment would you have to build into a baby so he will be able to distinguish between himself and another? First, the baby ought to be able to recognize that a set of stimuli coming from one person has some kind of organization different from that coming from somebody else or from himself. In addition, if the baby could perceive that kind of organization, then it would be very nice if the baby could selectively attend to it. Thirdly, we would want the baby to have some sense of causality among these different organizations.

What evidence is there that babies are so equipped? We know that with regard to sound and sight infants are "prewired" so that they look where a sound is coming from; they don't have to learn to put the two together. What kind of organizational structure does an adult have that might be different from what the baby has? One thing would be a temporal structure, a congruence between what is seen and heard. When I talk to you, it is impossible for me not to move my body in temporal synchrony with my speech. You recognized the temporal

organization between the sound and the sight of watching me, and the odds are the baby sees the same thing. The only evidence we have bearing on this are some experiments done by Spelke and others, showing that infants by three months have the capability for cross-modal integration, at least between vision and sound. A baby is shown two motion pictures, such as cartoons, each moving at a different rate. There is a sound box playing in synchrony with one of them, but not the other. The babies will most often look at the cartoon that is in synchrony with the sound, as if they know they have to put the two together. In fact, when the synchrony between the sound and the motion is disrupted, the babies get upset.

Another kind of organization, besides a temporal one, would be what I call intensity contour matching. For example, when you increase or decrease the intensity of your voice, you will similarly alter your physical movements. Most human behavior is expressed in such packages, with contours that are congruent one with another. Lewkowicz and Turkewitz used a buzzer with a certain loudness and a light of certain brightness to test this matching ability. They found that babies seem to have a preset notion of what level of sound ought to go with what level of brightness. As brightness increased or decreased, the babies made the assumption that the noise should also change in the same direction. So there seems to be some ability to match the intensity contour.

What evidence is there that the baby could use these kinds of information to tell that a distinctive set of stimuli belongs to one person and a different set to himself? If the baby is crying, for instance, he will feel the pressure in his lungs having a certain contour, while the sound and the body movements have the same contour. If the baby can, in fact, attend to the temporal structure and the contour matching structure, can the baby receive that information without a lot of interference from extraneous things in the world? Suppose he is looking at the mother and he is moving and making sounds at

the same time. How does he know that his own actions are different from what he sees in the mother? In an ingenious experiment by Walker and colleagues, two motion pictures of inanimate objects were superimposed on the same spot on the screen. The sound track to only one of them was played. As the babies watched, the images were slowly separated. It turned out the babies were paying attention mainly to the one that had the sound track. In other words, they were able to follow the organization of one thing without interference from another object with a different temporal structure and intensity contour. So even while the baby is kicking and vocalizing, he should be able to follow the organization of the mother's behavior.

In the area of causal relations, Watson and others have shown that by the age of three months the baby can discriminate different schedules of reinforcement. One of the crucial features of a self-to-self interaction is that it almost always involves continuous reinforcement. When you suck your finger, it is your finger that gets sucked. In most interactions between the baby and the mother there is not continuous reinforcement, but a variable or some other schedule. Therefore, since babies can make that distinction, the pattern of reinforcement is another bit of information helping the baby to discriminate between self and other.

Another assumption in the traditional view of the baby was that the baby did not have adequate memory until about eight months. There is evidence, however, which suggests they probably do have adequate memory to be able to handle these problems.

In light of the above, the infant by three or four months should have little trouble in discriminating each participant's behavior as differently structured, and separated, and engaged in causal relations one with the other. Further, some lasting representations of these separate entities must begin to get formed because of the powerful forces impelling the categorization and mental representation of all the baby's experiences.

Next I would like to speculate about the different kinds of experience that an infant might have *being with* somebody else; I will call it a typology of "being with." I would like to begin where the experience of the self and the other is one of *similarity*. The partners are doing the same thing, as against an experience where the partners are doing something that is *complementary*. It might seem that when the self and the other are doing similar things the cues of temporal structure and the intensity contour would be obscured, so that the baby should not be able to tell the difference between self and the other. In a complementary relationship, those cues are not obscured, so the baby should be able to maintain the distinction between self and the other. The third kind of experience between a baby and a mother is one of *altering states of consciousness by way of another*. The fourth type of interaction involves *deceit*, which is very important in mother-baby interactions.

Some examples of similarity, where the cues get obscured, include simultaneous imitation, and mutual gaze. The cues also get obliterated when mother and baby vocalize together; this happens a great deal at three months when simultaneous vocalization is more common than dialogic vocalization. Interactional synchrony, as Condon and Sander have described, falls into this category where the distinctiveness of cues no longer exists. These all are highly emotional, fairly intense interpersonal moments, and they probably have a great deal to do with formation of intimacy. In all these experiences it seems it would be very hard for the baby to tell the difference between the partners.

With complementary interactions the cues are such that there should be no problem in maintaining the constancy of self versus other. Cuddling is one such interaction, where one partner is active and the other is passive; that is really the essence of this distinction. Another complementary interaction is the greeting response that the baby gives by two months; when he sees another face, his face opens up and he starts to

move the arms as if to reach.

In the beginning these complementary experiences can be considered to be biologically determined in the sense that the experience occurs only along with the sensation of the other person, since the other provides the eliciting conditions as well as the complementary sensations. Later in development, the actual presence of the eliciting person may no longer be necessary, since the child can evoke the representation of the earlier experience with the other person to trigger the behavior. There are some social behaviors that do not fall into this category, and the smile is a good example. Although the smile seems to have a social origin, by the sixth to eighth month of life infants will smile when they have mastered a task, even if they are alone. It is not very convincing to say they evoke an image of somebody there smiling back at them. I think such a smile is more an internal thing, which is not true of cuddling or kissing. There you have to evoke the image of the other person, otherwise your own experience cannot exist.

The central point I want to make is that the nature of these complementary self-other experiences is biologically determined to a considerable degree, just like the prestructured perception of objects which we discussed before. It is the biological constraint of life that very important parts of ourselves can never be experienced or represented without a complementary aspect of the other. In other words, the baby needs human interaction to develop.

The third kind of experience is where the baby undergoes a change due to the other's behavior. Examples are: feeding the hungry baby who then becomes happy, has physiological needs gratified, and falls asleep, or comforting a stressed infant, causing a change in state.

The last type of experience involves self-other deceit, the experience of being with somebody where what appears to be happening is not really what's happening. I think this happens very early in life, in large part because of the asymmetrical nature of the mother-infant relation-

ship. The mother is in command of much more. Usually she has multiple agendas while the baby has one agenda. For example, the mother is often tired and has to get the job done. This raises the issue of the purposes of affect in the mother-infant relationship.

In closing let me make two points. One of the reasons I believe it is so important to talk about relationships as different from interactions is that when you have a relationship there are two people involved, but acting through four entities: the two people, plus the two representations that each of them has of the other. These representations are based on the history, the continuity, and the specialness of their knowledge of each other.

The second point is to turn to some clinical issues. Consider, for instance, a mother who is told she has a premie who will probably be developmentally slow. One reaction may be to try very hard to help the child, overcompensating by becoming a super instructor instead of being a playful mother. When you become a good teacher and not a good playmate the way you talk changes, the way you use your face changes, and the *kinds* of interactions you will engage in with the baby change. You will have many fewer of the interactions that I call similarities, which have more to do with intimacy between two people. We see this happen where the mother and baby are fine except that the mother is working outside the home and comes home at night fatigued. It may be very hard to play with the baby. That changes the baby's experiences of different ways of being with her, and with others.

Obviously, there are a great many internal and external influences on these daily interactions, and on the development of a relationship. I would like to say that I could have talked only about the mother and not the baby, and would have come to the same conclusions.

A Critical Examination of Studies of Parent-Infant Bonding

by Earl Siegel, M.D., M.P.H.

The task assigned to me, an examination of studies of parent-infant bonding, may be viewed as straightforward and even non-controversial by some of you. There is, however, a muted backlash that questions the effectiveness of early and extended contact interventions, suggesting that we should take a critical look at the evidence.

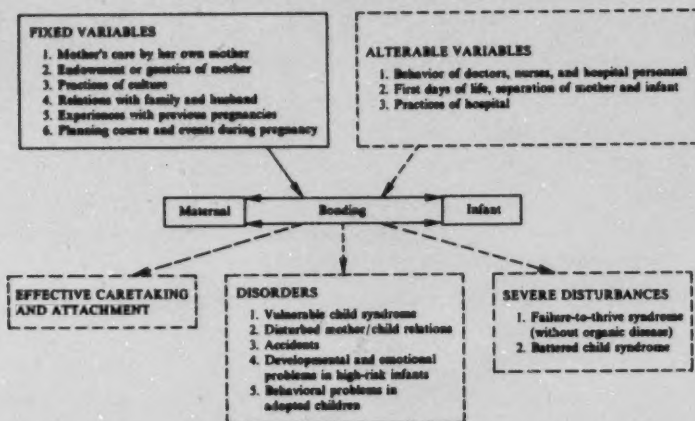
In this presentation, we will limit ourselves to *maternal* rather than parent-infant bonding. We shall also restrict ourselves to prospective studies with experimental research designs, which employed early and/or extended postpartum contact between mother and infant as the intervention variable. The hypothesized consequence of the contact was to affect favorably the quality of subsequent mother-to-infant attachment behavior. In these studies, full-term essentially normal infants comprised the samples.

CONCEPTUALIZATION. Klaus and Kennell first reported research on humans in 1972, suggesting that early and extended contact between a mother and her newborn infant promoted maternal-infant bonding (Figure 1). Despite inclusion of the "fixed" influences in the model, little importance was attached to them when results were presented. Further, the role of events that followed early and/or extended contact received virtually no attention in study designs. As we discuss subsequent bonding studies, I shall build a case for a revised conceptualization.

RESEARCH DESIGN. Research designs have varied substantially as to sample characteristics, sample size, outcome measures employed and the confounding variables included in data collection and analysis. However, every study we shall cite assigned mother-

FIGURE 1

Major Influences on Maternal Behavior and the Resulting Disturbances

Source: Klaus, Marshall H. and Kennell, John H. *Maternal-Infant Bonding*. C.V. Mosby Company, St. Louis, Missouri, 1976.

infant pairs randomly to experimental and control groups. (Few, if any, perinatal clinical procedures have had the benefit of as many randomized trials as have been applied to bonding studies.)

Several studies employed the Klaus/Kennell *combined* early and extended contact, that is, at least 45 minutes of skin-to-skin contact within the first three hours after birth and five hours of additional contact during each postpartum hospital day. Most studies, however, provided *only early* contact during the first several hours after birth. In one study a third type of intervention — extended contact — occurred after an average delay of eight hours and consisted of six additional hours of rooming-in during days one and two. Interestingly, the latter study reported the most impressive long range effects on parenting behavior.

Thus, the intervention or "treatment" variable, though restricted to the first postpartum hours or days, has been modified from one study to the next, making it difficult to determine the precise timing of a sensitive period.

SAMPLE CHARACTERISTICS. Study samples have included mother-infant pairs from a number of different

hospital settings in the United States as well as from Latin America, Sweden and Jamaica. While most samples were drawn from low socio-economic status populations, the Swedish samples were basically middle income. All studies but one were limited to primiparous mothers. In almost all studies the socio-demographic and occasionally the health characteristics of experimental and control groups were compared. Few differences between them were found, suggesting that random assignment has occurred.

Sample sizes varied considerably, as low as 14 experimental and 14 controls, to N's of 148 and 153, respectively. Inevitably, sample attrition occurred when outcomes were measured beyond the postpartum period. Where sample sizes were small or attrition great, there is the hazard that, despite random assignment, factors other than early and/or extended contact contributed to observed outcome differences.

IMMEDIATE AND SHORT RANGE OUTCOMES.

The studies that observed maternal-infant behavior during the first postpartum days provide immediate and short range outcome measures. Based on findings of replicated, carefully controlled investigations, it appears that early contact, irrespective of its supplementation by extended contact, favorably affects maternal affectional behavior during the first postpartum days. The results are consistent across low and middle socio-economic status mother-infant pairs as well as in developed and less developed countries.

INTERMEDIATE RANGE OUTCOMES. There can be little dispute about a significant relationship between early contact and the duration of breast feeding. In Sweden, Brazil, Guatemala and Jamaica the effects of early contact were persuasive, clinically and statistically significant when measured at two to three months and even at one year.

Observations of maternal-infant behavior at several months yield findings that also seem to support a sensi-

tive period. But, there are fewer such studies, and these often report *only* statistically significant observations, and are limited to bivariate analysis techniques. Reported positive findings associated with early and/or extended contact include specific maternal behaviors such as increased eye-to-eye contact, smiling, singing, kissing and vocalization. Infants have been reported as significantly more responsive and alert.

LONG RANGE OUTCOMES. To date four studies have reported results at one year or later: first, follow up at two years and five years for the original Klaus and Kennell groups; second, the O'Connor et al. extended contact or rooming-in study from Nashville; third, an early contact Swedish investigation; and finally a bonding study carried out by Schaefer, Bauman, and me in Greensboro. These represent the only reported observations beyond several months. Since much of the controversy regarding bonding derives from issues related to long range effects, we shall examine these studies in more detail.

Of the Klaus and Kennell 14 experimental and 14 control children, nine and ten, respectively, were observed at two years for 1½ hours in five separate situations. Differences between the groups were found, favoring mothers and children who received early and extended contact. But these effects were limited to increased maternal language stimulation, observed in only one of the five situations. Since early language stimulation is associated with later IQ performance, such an inference for the early contact children is attractive. However, initial small sample sizes and sample attrition suggest caution when interpreting the two-year observations. Further, findings obtained from observations made in the four other situations have not been reported.

At five years the nine experimental and ten control children were given three standardized IQ and linguistic functioning tests. Results suggest that *within* the experimental group, the more "stimulation" language the

mother used with her child at two years, the higher the child's speech and language comprehension scores at five years. On the other hand, in the control pairs no significant differences were noted between mother's language behavior at two years and the children's at five. When two-way analyses of variance were used, with intervention and sex as the independent variables, no significant differences on any of the tests were found.

deChateau and his colleagues in their study design limited early contact to 15-20 minutes of skin-to-skin contact and suckling following delivery. With 22 primiparas in the experimental group and 20 primiparous controls, they found differences in several attachment behaviors, at three months and one year.

As a frame of reference for further assessment of the long range impact of the bonding studies, I would like to review our Greensboro study in more detail. Systematic observations of mother-infant behavior were made in the home at four and twelve months. We studied 202 low income women* with uncomplicated pregnancies, randomly assigned to four intervention groups: early and extended contact plus home visits, only early and extended contact, only home visits, and controls. Two observers independently recorded their ratings immediately after each situation of bathing, dressing, feeding and play. Ratings on a 92 item Attachment Inventory also were completed after the home visits. Using factor analysis, we aggregated and organized all the observations into factor scores. At four months three factors emerged: "Acceptance," "Interaction/Stimulation," and "Consoling of Crying Baby." At 12 months, "Acceptance" and "Interaction/Stimulation" also emerged, but "Infant's Positive versus Negative Behavior" replaced the "Consoling" factor. In addition, reports of abuse and neglect, and health care utilization

*Approximately one-quarter of the women were white and about one-third were currently unmarried. They averaged 0.8 babies before the index pregnancy, had attained 11 years education and averaged 21 years of age.

data were collected through the age of one year.

Unique to the Greensboro study was the use of multiple regression analyses. Maternal background variables — race, marital status, parity, education, age, and a Peabody Picture Vocabulary Test Score — were obtained from interviews conducted in the third trimester of pregnancy. The multiple regression analysis strategy had an important methodological advantage. It allowed assessment of the relative contribution of the interventions, after the socio-environmental background variables had explained variance in the dependent maternal-infant attachment variables.

Table 1 shows the results of the multiple regressions on the three attachment factors at four months. Almost 22% of the variance in "Acceptance" was accounted for by the background variables ($p < .0001$), early and extended contact added 2.5% to the amount of variance explained ($p < .04$), but neither the home visit nor home visit with early contact increased the amount of variance explained. Although the background variables were related to "Interaction/Stimulation" ($p < .0001$), none of the interventions improved the prediction of this attachment factor. Slightly more than 10% of the variance in "Consoling of Crying Infant" was explained by the background variables ($p < .03$), early and extended contact added 2.5% ($p < .05$), but again neither home visit nor home visit with early contact increased the amount of variance explained.

TABLE 1
Regression Analysis of Selected Variables on
Attachment Factors at Four Months
($N=149$)

Attachment Factors	Variable ^a				
	Background ^b	Home Visit	Early and Extended Contact	Home Visit Plus Early and Extended Contact	Total Model
Acceptance	0.217, $p < .0001$	0.221, NS	0.245, $p < .04$	0.258, NS	$p < .0001$
Interaction/Stimulation	0.198, $p < .0001$	0.198, NS	0.203, NS	0.209, NS	$p < .0002$
Consoling of Crying Infant	0.162, $p < .03$	0.110, NS	0.135, $p < .05$	0.136, NS	$p < .02$

^aConstantive variances and significance levels (significance level of the increase in predicted variances).
^bRace, marital status, parity, education, age, and Peabody Picture Vocabulary Test.

Source: Siegel, B., Deussen, E.E., Schneider, E.S., et al. Hospital and home support during infancy: Impact on maternal attachment, child abuse and neglect, and health care utilization. *Pediatrics*, 66: 2, August 1980, pp. 183-190.

The 12-month results are shown in Table 2. Neither background nor intervention variables were significantly related to "Acceptance." The background variables were related to "Interaction/Stimulation" ($p < .0001$), but none of the interventions explained additional amounts of variance in that factor. Early and extended contact was the only variable significantly related to the "Infant's Positive/Negative Behavior" ($p < .04$), explaining 3.2% of the variance.

TABLE 2
Regression Analysis of Selected Variables on
Attachment Factors at Twelve Months
(N=149)

Attachment Factors	Variable*				
	Background†	Home Visit	Early and Extended Contact	Home Visit Plus Early and Extended Contact	Total Model
Acceptance	0.004, NS	0.083, NS	0.085, NS	0.091, NS	NS
Interaction/Stimulation	0.190, $p < .0001$	0.193, NS	0.201, NS	0.203, NS	$p < .004$
Infant's Positive/Negative Behavior	0.046, NS	0.046, NS	0.078, $p < .04$	0.078, NS	NS

*Cumulative variances and significance levels (significance level of the increase in predicted variances).

†Race, marital status, parity, education, age, and Peabody Picture Vocabulary Test.

Source: Siegel, E., Brozman, E.E., Schneider, E.S., et al. Hospital and home support during infancy: Impact on maternal attachment, child abuse and neglect, and health care utilization, *Pediatrics*, 66: 2, August 1980, pp. 183-190.

We found no relationship between the type of intervention and reports of abuse and neglect on the health care utilization data collected. In sum, the background variables were the most strongly associated with our outcome measures, with early and extended contact having some influence. The home visits had little effect.

The O'Connor study also assessed long range effects. One hundred forty-three low income Nashville women were assigned randomly to an additional eight and one-half hours of contact, but only after the infant was at least seven hours old (range 7-21 hours); 158 mother-infant pairs received routine contact. Sample characteristics were similar to those in the Greensboro groups, although O'Connor only studied primiparas. Outcome measures were obtained at a mean age of 17 months (range 12-21 months) and consisted of data from reports to Protective Services and from Nashville General

Hospital medical records. Using stringent criteria such as physical abuse, surrender of child, or nonorganic failure to thrive, families with substantial parenting inadequacy were ascertained. Two extended contact and 10 control children experienced inadequate parenting. Of these, one extended contact and eight control children were hospitalized for these problems. In addition, no extended contact and five control children were cared for by adults other than their own parents. Although the number of cases was small, these differences were significant ($p < .05$). No significant differences were found in health care utilization, infestations and gastroenteritis, or accidents.

These results apparently contradict our findings on abuse and neglect in Greensboro. However, several major methodological differences between the studies stand out. The type of intervention varied somewhat, and the Greensboro study included multiparous *and* primiparous women. Protective Services records seem to have been collected with comparable completeness in both studies. Although we had difficulty accessing the children's medical records, we felt we covered all the relevant sources. Nashville General Hospital medical records data were readily obtained, but presumably information was not collected from other sources. The authors, acknowledging this possible bias, cite similar utilization of clinic and emergency room services by extended contact and control groups. While we followed infants to 12 months of age, the Nashville sample was followed to an average of 17 months. Our observations and ratings were intended to assess attachment, while O'Connor examined the *lack* of attachment, in the form of parenting inadequacy. While our measures of attachment were quite detailed, ascertainment of gross parenting inadequacy may require access to the child's *complete* medical records, which we did not have. Also, the Nashville study, with a larger sample size, generated greater power in its analyses of reports of abuse and neglect. Given the relative infrequency of abuse and

neglect, adequate sample size is useful in avoiding acceptance of the null hypothesis.

DISCUSSION. A number of questions remain. What is well documented and what do we need to find out? What theoretical basis is there for a maternal-infant bonding construct? What is the relationship between bonding and attachment? What mechanisms link brief early and/or extended contact to subsequent outcome measures? What clinically useful significance derives from the findings?

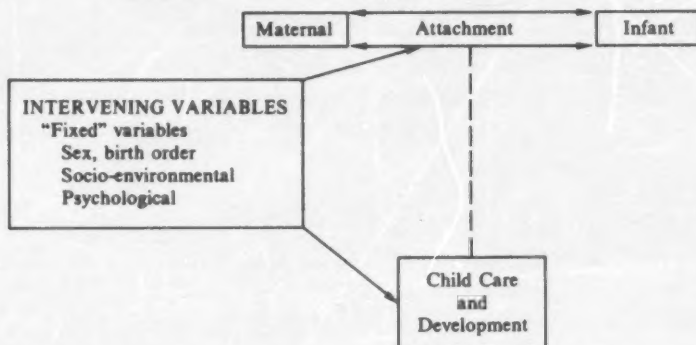
Researchers have empirically documented an undeniable impact of early contact on a series of affectionate maternal behaviors during the first postpartum days. Mechanisms for such behaviors, though fragmentary, appear plausible. It seems reasonable to hypothesize that early and/or extended contact facilitates an initial sensitive period, enhancing synchrony between the newborn's signals and the mother's responsiveness. As they experience contingently satisfying interactions, the synchrony or reciprocity grows.

In my opinion, the Klaus and Kennell model (Figure 1) was appropriately conceptualized, but too often studies of maternal-infant bonding limited their data collection and analyses to a single "alterable" variable — early and/or extended contact. But outcome measures are influenced by a number of confounding variables, partially represented in the "fixed" variable box. For example, as the model indicates, a mother's own care as a child and her past cultural, prenatal and other intrapartum experiences also explain variance in maternal-infant behavior. The relationship is further influenced by such variables as the infant's temperament, sex, and birth order as well as the mother's temperament and perceptions of her infant. So, variation in maternal-infant bonding is complex and multifactorial.

Having accepted that prior experiences and early contact *together* determine maternal-infant bonding, I suggest that an evolving process ensues. In Figure 2, we hypothesize that attachment, though influenced by early

bonding, also is substantially affected by a number of intervening variables. The "fixed" variables, some of which may change over time, continue to play major roles. Socio-environmental and psychological influences include marital status, age, education, and economic condition. With regard to the statistically significant outcomes observed at several months in many studies, we need to be concerned with the small sample sizes, the large number of maternal attachment behaviors and other outcome measures that were uninfluenced by early contact, and the lack of control in the analyses. Even with randomization, the intervening or confounding variables contribute to variance.

FIGURE 2
Major Influences on Maternal-Infant Behavior
and Subsequent Child Care, Health and Development



Adapted from: Klaus, Marshall H. and Kennell, John H.: *Maternal-Infant Bonding*.
C.V. Mosby Company, St. Louis, Missouri, 1976.

Reported long range outcomes at one year and beyond are contradictory and come from only a few studies, although some residual effects of early and extended contact on parenting behavior and child development do seem to persist. It appears that we have over-estimated and over-interpreted modest long range outcomes, setting us up for criticism, even by supportive investigators.

In closing, let's consider the clinical and practical

significance of the studies examined. Institutional and professional practices that enhance close contact between parents and their infants during the postpartum period are simple, safe, inexpensive and have documented short and intermediate range impacts. We need to maximize their availability to all families. However, we must recognize that basic antecedents to favorable parent-infant relationships begin prior to the time of early and extended contact. Therefore, we need to employ the full range of activities that may affect the known co-variables. Important interventions include family planning, comprehensive prenatal care, and particularly, family supports to reduce socio-environmental and psychological stresses.

In a thoughtful commentary Haggerty compared parent-infant bonding and home visitor interventions to Head Start and other developmental stimulation programs of the 1960s:

"Like these programs, which went through a phase of initial enthusiasm followed by premature disillusionment, it is important not to fall into the same trap with early contact and home support systems. A decade later we are learning that the social programs of the '60's did have some impact."

He concluded by damning the simplicities and urging that we avoid the search for quick fixes. I say, "Amen."

Maternal Stress Following the Birth of a Second Child

by Annette Lynch, R.N., M.S.N.

The purpose of this study was to determine from mothers who had delivered a second child what stress was being encountered in the first eight weeks after the baby was born. Forty mothers were involved in this investiga-

tion, all married and none with a high-risk pregnancy. The babies were normal, full-term infants delivered vaginally. The mothers were from 18 to 36 years old (mean age of 28.7). Seventy percent of this sample chose to breastfeed their babies, and 73% said the pregnancy was planned. Most of those who had an unplanned pregnancy had less than two years between their children. The spacing between children was 1 to 8.67 years apart, with a mean spacing of 3.43 years. Twenty of the mothers did plan to return to work, outside the home, and 15 of those planned to work within 10 months after the baby was born. Based on the Hollingshead's Two Factor Index of Social Position (1957), 70% of this sample was in the Class I and II categories, indicating a high socio-economic level for the majority of subjects in this sample.

After an initial interview in the hospital, within four days postpartum, mothers were interviewed in their homes six to nine weeks after the baby was born. The instrument consisted of demographic information and the identification of specific variables which were thought to influence the identification of stressors. Part Two of the interview consisted of 60 free response items, divided into areas dealing with the infant, the older child, the husband, and the mother herself. Each item was evaluated according to the degree of concern for the mother. At the end of the questionnaire, there were two open-ended questions in which mothers were allowed to say which stressor was most important, and if there were any items that hadn't been listed that concerned them.

In the eight weeks following the birth of their second child, mothers in this study experienced their greatest stress in areas of self-concern. Change in body figure, self image, and change in abdominal muscle tone were stressful for at least 75% of the mothers. Mothers commented that they did not regain their shapes as quickly as they had after the birth of their first child.

Mothers in this study expressed no time for self, inability to get out, and feeling tied down as areas of great concern. Since the study was conducted during the

winter months, it is possible that the weather was a contributing factor. Additional contributing factors could have been the lack of child care arrangements, the differences in the daily schedules of the infant and the older child, and the feelings of disorganization that the mother may have in getting two children ready to go anywhere.

Fatigue and interruption of sleep were also highly stressful items. The advice frequently given to new mothers is to rest when the baby does. The mother of two may not have time during the day when both children are resting; the older child may not even take a daily nap. When considering the mother's lack of continuous sleep at night, and no chance for rest periods during the day, the resulting fatigue is not surprising.

The older child's behavior in general was not as problematic as expected. Many mothers had expected regression in the older child's behavior, such as a reversal in toilet training or eating habits. What bothered the mothers most was not regression, but that the child's behavior was somehow *different*, that the relationship with the older child was changed, and that this was a reflection of their mothering abilities as a whole. They felt they weren't capable enough to mother two children.

Infant-related concerns were not perceived as stressful by most mothers. Husband's increased financial problems were stressful for 11 mothers, but items dealing with husbands caused little stress when compared with other areas. Physical discomforts such as vaginal bleeding, urinary tract infections, and cracked nipples were cited as concerns comparatively often.

The most distinguishing variable in examining the stressors for the mothers was the interval between the two children. When children were less than two years apart, the mothers experienced a great deal of stress. The toddler is beginning to develop independence, but the mother is still paramount in his life. The competition for her attention is too difficult for the toddler to handle. Mothers with children closely spaced had less time for

themselves and were more fatigued.

Mothers whose two children were greater than six years apart also experienced a great amount of stress. All mothers in this study with children older than six years had planned the pregnancy. However, they had greater self-concern; these mothers had been relatively free from child care activities prior to the birth of the baby, with the older child in school. With the coming of the baby, lack of time for self, not being able to go out as much, and feeling lonely were highly stressful items. The second child was almost another "first baby." These mothers experienced minimal difficulty in their older child's behavior, probably due to the developmental stage of the older child. The child of six has greater ability to cope with the baby because he is more sure of his place within the family. In this study, maternal stress was least when the children were four to six years apart.

Bottle feeding mothers expressed more concern overall than breastfeeding mothers, particularly over the infant's unpredictable schedule. A possible explanation is that most nursing mothers tend to feed their infants on demand and do not anticipate their infants will be on a schedule at eight weeks of age. Also, it may be that nursing mothers have one free arm to cuddle the older child, while bottle feeding takes two hands, an actual physical constraint in relations with the older child.

Unplanned pregnancy was extremely high in its correlation with identified stress. It may be that the mother had not gone through the psychological changes usually associated with pregnancy, delaying attachment with the newborn. There may have been external reasons that the time was not "right" for a new baby in the family. Most of the unplanned pregnancies resulted in spacing of less than two years between children. As already mentioned, such a family structure itself may in fact be the most significant cause of stress when a pregnancy is unplanned.

Initially, 29 mothers planned to return to work. Half this number, only 15, still planned to go back to work by

the time the second interview took place. The women felt that they could just not handle going back to work. Women who had gone back to work expressed difficulty in coping. Seventy-five percent of the sample was from the upper socio-economic groups, so returning to work was not a financial necessity. The concerns expressed by these mothers were primarily about their body image, having enough time for their husbands and children, and the decline in their housekeeping standards. Mothers in the middle to lower class had stress as well, but theirs was primarily financial. These mothers also mentioned that the father was not spending much time with the children. Several of these fathers were working more than one job. When the mother needed input and help from her spouse as the father figure, she was not getting it simply because he was working overtime to meet their new expenses.

What do these findings mean for health professionals? The mothers do experience a change in their older children's behavior; if the children were allowed to participate more in the coming event, they would be more prepared for the new baby. Prenatal classes for the family perhaps could strengthen the family relationships. The father could be encouraged to take a more active role in parenting, by including fathers more in prenatal education. Parents are not as geographically close to their own parents as they once were, so there is a need for a support system for new mothers. We could offer round-table discussions for mothers while they are still in the hospital. In terms of family planning, this study showed that people who had babies less than two years apart were under the greatest stress. Many of these pregnancies were unplanned. Were they unplanned merely because the birth control they used did not work? Was lactation assumed to prevent pregnancy? If the couple chooses to have children very close together, they should have a chance to discuss the changes that might take place in the family. The most optimum spacing, as seen in this study, is four to six years apart.

We have talked a lot in this conference about people

who have sick babies, or other special problems, but we did not really stress the fact that normal mothers need help too when they come home from the hospital. In this study, there were no problems with the babies, yet there were many questions the women had about themselves and their families. Unfortunately, they did not feel comfortable enough to call their physician, because of the feeling that "it is not my first baby, I should know better." Nevertheless, a clinical nurse specialist, other health professional, or even trained volunteers, should call these mothers within two weeks after they go home. Sometimes the ear of a sympathetic listener, with experience and resources to tap, is all that is needed.

The Father's Role in Family Development

by Ross D. Parke, Ph.D.

The theme that I want to stress today is that we must have the father take his rightful place alongside the mother in the development of the baby. I would like to emphasize various ways in which fathers play a role in infancy both directly in feeding the baby, or playing with the baby, and also indirectly, by providing support for the mother.

FATHERS AND NEWBORNS. One aim of our research has been to determine how fathers and mothers differ in their early interactions with young infants. Our own observations, which began in 1970, revealed that fathers were just as involved with their newborn infants as mothers. They looked at the infants, touched and rocked them and vocalized to them just as often as mothers. Fathers were just as active when they were alone with the babies as when their wives were present. Mothers surpassed fathers in only one way — smiling. However, the reason for the higher rate of mothers'

smiling may be that females simply smile more than males, not just at babies but at all kinds of people.

David Phillips and I have recently taken a closer look at one part of the early parent-infant exchange, the types of speech that mothers and fathers use in talking to their newborns. Fathers, as well as mothers, change their styles of speech when addressing their new offspring. They speak in shorter phrases, about half as long as the phrases used when speaking with adults. They repeat their messages much more often and slow their rate of talking. All these changes in the style of speaking are likely to increase the extent to which the baby pays attention or looks at the parent. In turn, the changes may make it easier for the infant to learn to recognize his caregivers.

The social setting makes a difference in the behavior of fathers. When we observe fathers and mothers together, fathers smile and explore (count fingers and toes, check eyes and ears, etc.) more than when they are alone with the baby. Mothers show a similar pattern of increased interest when their husbands are present.

FATHERS AS CAREGIVERS. Fathers are active and involved, but are they involved in all aspects of early newborn care? Apparently not. Our studies indicate that fathers' involvement is selective even in the earliest interactions. Consistent with our cultural stereotypes, fathers are less likely than mothers to be actively involved in caretaking activities such as feeding or changing diapers. Fathers are more likely to play with babies (vocalize, touch, imitate) than to feed them. These findings suggest that parental roles as caretaker or playmate begin to emerge even in the earliest days of the infant's life. This pattern may be part of a general shift toward a more traditional division of responsibilities that occurs in most families after the birth of a baby. Even in families where there is an egalitarian sharing of household tasks before a child arrives, this shift toward traditionally defined roles seems to occur.

Are fathers less competent to care for infants? If so, this would easily explain their limited involvement in care-

taking. However, fathers are just as competent and capable of taking care of infants, according to our research. We define competence as the parent's ability to correctly "read," interpret and respond to the infant's cues or signals. To assess fathers' feeding skills, we determined how sensitively fathers reacted to infant distress signals, such as spitting up, sneezing and coughing. Fathers reacted just as quickly and appropriately as mothers did. However, fathers tend to be more cautious, stop feeding and look more closely and inhibit touching more than mothers. In contrast, mothers are more likely to continue the feeding, look more closely, and gently stimulate the baby by touching. The patterns are different but both mother and father show sensitivity and responsiveness to the ongoing behavioral cues of the infant. In response to an infant vocalization, for example, parents tend to look more closely, to vocalize, to touch, and they tend to continue the feeding more. In other words, in the brief period after the baby vocalizes, both parents are more likely to vocalize and touch in return.

Fathers and mothers are differentially responsive to some cues, such as the infant smile. While both parents are responsive, mothers tend to be more responsive to infant smiling than fathers. This coincides with our earlier observation that mothers generally smile at babies more than fathers. There is some data that even as neonates females may show more spontaneous smiling than males. So we see some differences in the cues that mothers and fathers respond to although both are clearly responsive to infant behavior. Thus, fathers generally do not play as active a role in feeding but when they are called upon, they are capable and responsive to infant cues. Finally, when we measured the milk consumption in a standardized feeding period, it was about the same whether father or mother was feeding.

However, mothers' and fathers' roles are not fixed, but are constantly undergoing re-evaluation and revision in response to changing conditions. Recent research suggests that certain medical practices, such as cesarean

childbirth, can alter the fathers' level of participation in routine caretaking activities. In a recent study, Pedersen and his colleagues found that fathers of cesarean-delivered infants engaged in significantly more caregiving at five months than fathers in a comparison group whose infants were vaginally delivered. While the fathers of the cesarean-delivered infants were more likely to share caregiving responsibilities in several different areas on an equal basis with the mother, fathers in the comparison sample tended to "help out," with the mothers still meeting the major proportion of caregiving needs.

The most probable explanation for these findings suggests that mothers, as a result of the surgery, are unable to assume a fully active role in caregiving during the early postpartum weeks. Fathers, in turn, as a result of their increased involvement in early care, continue this caregiving activity even after the time that the mother is able to resume a more active role. Support for this analysis comes from Entwisle and Doering who found that women who underwent cesarean delivery were less positive about caring for their baby than vaginally-delivered mothers, at least during the early postpartum months. These findings illustrate the ways in which shifts in the mother's behavior and needs — as a result of the type of childbirth — can influence the father's level of participation.

Another situation that may increase father's role in early caregiving is premature birth of a baby. Approximately 14% of infants in the United States are born prematurely and an increasingly large number of these infants are surviving. Having an infant earlier than expected can be stressful for the family, thereby increasing the importance of the father's support for the mother. Investigators in both England and the United States have recently found that fathers of premature infants are more active in feeding, diapering, and bathing their infants than fathers of full-term babies, both in the hospital and later at home. These fathers' more active

participation in caregiving is particularly helpful because premature infants usually need to be fed more often than full-term infants and experience more feeding disturbances. Premature infants also can be less satisfying to feed and to interact with, because they are often less responsive to parental stimulation than full-term infants. Thus by sharing more than usual in caregiving, the father of a premature infant relieves the mother of some of this responsibility, giving the mother some much-needed rest. He thereby may indirectly influence the baby by positively affecting the relationship between mother and baby. The father's support is important in other ways as well. Often a premature infant is kept in the hospital for a period of time, and the father can play an important role by visiting and becoming acquainted with the baby during this period. His involvement continues in the home because of that early exposure and possible training from staff in caretaking. It may be that medical staff define fathers differently in cesarean or premature births; that is, as a result of the greater contact they have with fathers, they may be legitimizing his more active involvement in caretaking. Another possibility to explain greater involvement is that in cesarean and premature births, fathers may in fact have more early contact than mothers. The work to tease apart the critical factors remains to be carried out.

Fathers' contributions to caregiving are not limited to their direct involvement in feeding and diapering; fathers can also contribute to caregiving in indirect ways. Fathers should be viewed as part of a family system and even if father is not feeding or changing diapers, he can still have an enormous influence on these activities. Pedersen has found that the extent to which the husband-wife relationship is mutually supportive, and particularly whether the father views the mother as a competent and effective caretaker, are correlated with independent assessments of the mother as a caretaker (how well she paces the feed and how responsive she is to infant cues). It could be that the mother is competent and therefore

the father views it that way, or by viewing the mother as competent and giving her emotional support, the father, in fact, facilitates her executing her caretaking role more effectively. In other words, father has an impact on the mother-infant relationship indirectly. I think we have a lot more to learn about the ways that fathers can support mothers, even in the breastfeeding context. Feeding, however, is not the only important interactional context. Next we turn to another significant context — play.

FATHERS AS PLAYMATES. Although mothers contribute to caregiving more than fathers, fathers are not necessarily uninvolved with their infants. Both mothers and fathers are active playmates for their infants and children; however, fathers devote a higher proportion of their time with their children to play than mothers. More importantly, mothers and fathers play differently. We now have evidence of these kinds of differences as early as three weeks with full-term babies. The play situation is interesting because it allows one to capture stylistic differences between mothers and fathers. In caretaking there may be some interchangeability, but in play situations, they clearly play distinctive roles, providing a variety of contrasting experiences for the baby.

Mothers' play is more verbal, didactic and toy mediated. These types of play are basically distance receptor mediated, involving stimulation by the face, the voice, or a toy, rather than through physical contact. Fathers' play tends to be physical and arousing, such as bouncing and lifting games. In our recent studies of eight-month-old infants, Power and I found that fathers were particularly likely to play physically with their boy infants and were less physical with their girls.

Parent-infant play may have an important impact on the child's later social and cognitive development. Some games serve the purpose of engaging the infant's attention and maintaining the social interaction between parent and infant. Toy-mediated play and bouncing and lifting games may serve these functions. Other games

such as grasping and retrieving games may teach the infant turn-taking skills and provide early lessons in control of the social environment. Of special interest is father's specialty: physically-arousing play. We think that perhaps the vigorous physical play of fathers, especially with their boys, may not only be associated with the higher rates of physical aggression on the part of boys than girls, but also that boys may learn to regulate their physical aggression and avoid causing harm to their play partners as a result of experiencing competent interactive physical play with their fathers at an earlier age. Effective peer-peer play, in fact, may be learned through early play with parents, especially fathers.

Just as caregiving roles for mothers and fathers are not fixed, neither are either the quality or quantity of play patterns. The classic pattern of fathers being more vigorous and more physical with their infants than mothers is not true for all types of infants. In our current study of father's role in the development of pre-term infants, the usual pattern of physical play for fathers was not evident. By three weeks, fathers of full-term babies show more physical play than mothers, but fathers of premature infants did not play in a physical manner. Fathers seem reluctant to become involved physically with these babies. We are now looking to see how long this lack of physical play persists. Even though the healthy pre-terms in our study are physically capable of this kind of interaction, we feel that fathers (and mothers) may develop an early cognitive set about these infants that is independent of their actual physical status. This, in turn, determines their treatment of their infants.

The increase in maternal employment outside the home may affect play patterns as well. In contrast to the usual finding that fathers play more than mothers, Pedersen and his co-workers found that mothers played more with their five-month-old infants if they held a job outside the home. Since the observations took place in the evenings after both parents came home from their jobs, the mother may have played more as a way of re-

establishing contact with her baby after being away from home for the day. One result was that fathers in these two-earner families had less play time with their infants. However, the mothers and fathers did not shift their *style* of play: mothers were still more verbal and less physical than fathers. Family work organization clearly can affect father's status as primary playmate. Whether or not these mothers continue to be as active play partners as the baby grows older, however, remains unanswered. It is clear, however, that play patterns are not fixed, but may shift in response to factors such as the type of infant or changing societal work arrangements.

PROVIDING SUPPORT FOR FATHERS. Just as mothers can benefit from opportunities to learn and practice caretaking skills, in a time when fathers are increasingly being expected to share care-taking responsibilities, these learning opportunities need to be available for fathers as well. Supportive intervention for fathers might assume a variety of forms. First, an increase in opportunities for learning caretaking skills is needed. Such opportunities might be provided through pre- and postpartum training programs for fathers. Second, fathers need increased opportunities to practice and implement these skills. Paternity leaves would help provide these opportunities. Opportunities for contact with the infant in the early postpartum period could alter subsequent parent-infant interaction patterns. Preliminary evidence from recent studies suggests that father-infant interaction patterns can be modified by hospital-based interventions. John Lind, a Swedish obstetrician, found that fathers who were provided the opportunity to learn and practice caretaking skills during the postpartum hospital period were more involved in the care of the infant three months later at home.

My colleagues Shelley Hymel, Thomas Power, and Barbara Tinsley and I recently presented to a group of American fathers a videotape of father-infant interaction during the early postpartum hospital period. The video-

tape provided information concerning the newborn infant's perceptual and social competence, play techniques and caretaking skills. Fathers were then observed during feeding and play. Fathers who viewed the film were better able to maintain infant feeding and vocalized more to their infants — especially their first-born sons — during play. In addition, the fathers who saw the film in the hospital participated in feeding and diapering activities at home when their infants were three months old. However, the film increased the amount of caretaking only for fathers of boys; fathers of girls were unaffected by the film intervention. This selective effect of our intervention for boys is similar to earlier findings that fathers are more involved with sons than daughters.

Considerable care must be taken in the implementation of these support systems. One must consider parents' rights. The aim is not to impose on all families an implicit scenario of the liberated family and an endorsement of egalitarian family organization. Too often "more" is equated with "improvement." In many families, increased participation by the father may cause conflict and disruption as a result of the threat to well-established and satisfying role definitions. Intervention, therefore, should be sensitively geared to the needs of individual families, and the dynamics and beliefs of the couple should be recognized at the outset.

In conclusion, fathers are competent caregivers but both mothers and fathers may contribute in different and complementary ways to the development of their infant. To provide support for fathers and mothers to help them execute their roles effectively should be our goal.

Some Thoughts on the Father-Child Relationship

by Erna P. Furman

In our Western culture previously accepted models of parenting have undergone considerable change during this century. Related customs and laws are in a state of flux and many different ways of parenting are now socially recognized and accepted. Many of us have struggled to adapt to these changes and have attempted to meet our society's demand on us to come up with individual "rules" of parenting. Does a child need a mother and a father? Does each parent have specific roles to fulfill? What happens when mother and father reverse roles or share them equally? Some hope that a father's participation in the baby's earliest bodily care will make him a more meaningful person to the child. Others feel that he will become less important when he ceases to be the family disciplinarian and wage earner. And still others consider father redundant if mother can provide for her child, or mother redundant if father assumes the tasks of child care.

In this paper I shall relate some current opinions about the father's role to what we know about the child's developmental needs and interactions with his parents. This is not intended as a prescription for child rearing or as a statement of norms for an ideal society.

SOME CURRENT ATTITUDES CONCERNING THE ROLE OF THE FATHER. Like yourselves I have of course been exposed to the complaints voiced by women that men expect their wives to serve them, clean for them, care for them when they are tired or sick, while at the same time, they fail to appreciate and respect their wives for rendering these services, and refuse to share in these chores which are the necessary underpinning of personal comfort.

The solution to this situation is often seen in women requiring their husbands to share and share alike in ful-

filling their own and each other's needs and, especially, in taking an equal part in the care of the children from babyhood on. This approach not only represents an attempt at fairness and equality, but is also seen as building the father-child relationship. It is indeed sometimes felt that a father who does not feed and change his baby will feel left out. Several male students in my high school course on child development were unsure of the role of the father other than as a mother-substitute or as the wage earner. In another group, several devoted fathers of nursery school children asked me if I could tell them what a father *is* for, *does* he have a role with his child that is different from the mother's? The role of the father is currently in danger of being as much underestimated as, in past generations, it was overestimated. In 1914 Freud wrote that no person is as important in a child's life as his father. He spoke, I believe, not primarily as a psychoanalyst but as a member of his generation, and I doubt that anyone then seriously questioned his remark; the father's importance as *the* head of the family was taken for granted.

THE FATHER-CHILD RELATIONSHIP IN BABYHOOD. For the mother, birth constitutes a step in differentiating the baby from herself. Under normal circumstances he remains a part of her mentally, and when she holds her baby and nurses him their bodily unit is restored. This feeling of physical and emotional oneness is essential to the mother's own well-being as well as to her capacity for effective mothering. As the infant grows, develops his own characteristics and contributes his share to their interactions, the mother increasingly regards him as a separate person, but her self-investment of him diminishes only very gradually and, to an extent, always remains a part of her relationship with him. What happens to him, even years later and when he is fully grown, continues to affect her in a way that is very different from her other relationships, however close and meaningful they may be.

The father-child relationship develops along some-

what different lines. The baby is never an integral part of his body. However, mentally and emotionally the infant is very much a part of him and, in this respect, his earliest, even prenatal relationship with the baby parallels the mother-child relationship. However, as Winnicott (1964) has stressed, the father's role and gratification initially lie not so much in his direct interaction with the baby but in his ability to relate to the mother-child unit as a whole. This enables him to feel with mother and baby, to protect them at the time of their greatest vulnerability. In this way the father's role for the mother-child unit is akin to the mother's role with the infant. In caring for them he cares for himself. When the father is prevented from assuming this part, for internal or external reasons, his development as a father is jeopardized. But beyond that, the father's special investment of the mother-child unit is essential to the mother who builds her relationship of devotion to the child with the help of his devotion to them.

In the earliest months the baby's interest gradually shifts from pleasure in fulfillment of his physical needs to the person who provides it. In the second half of the first year and from then on, companionship with the caring person comes to be as important as the fulfillment of needs and sometimes takes precedence over it. The well-developed baby in the latter part of his first year welcomes familiar people's specific approaches, and builds individual relationships with family members unrelated to need-fulfillment. One boy patient had lost his father through death at eleven months of age. For many years he kept poignant memories of little games with his Dad and of the special way his Dad picked him up high for a hello hug (Fiedler 1974).

In this kind of early relationship the father is loved as a person in his own right. The perception of him — his different look, feel, sound and smell — is appreciated and the interaction he offers enriches the child's experiences. Of course, this specific early father-child relationship exists only in addition to the need-fulfilling

mother-child relationship. When a need arises during mother's absence, the baby treats the father as a mother-substitute and the father then pleases the child when he acts as much as possible like the mother. As Burlingham (1964) points out, sameness of need-fulfillment becomes the goal rather than pleasure in diverse human responses.

THE FATHER'S RELATIONSHIP WITH THE TODDLER. The child's relationships remain largely need-bound throughout the second year, although father in his own right is increasingly appreciated. The father who does not primarily function in a maternal role is, to some degree, spared the toddler's phase-specific tormenting, controlling and possessive love which the mother experiences fully. However, as the main recipient of this tyrannical toddler love, the mother can assist the child in growing toward a more mature relationship, for which the less conflictual relationship with the father already acts as an incentive.

THE FATHER'S ROLE WITH THE PRE-SCHOOLER. Although this and every subsequent phase of the child's personality growth makes its unique demands on each parent, the parental task may be viewed as encompassing three aspects: (1) to enjoy a phase-appropriate relationship with the child, (2) to serve him or her as a model, and (3) to maintain a supportive attitude to his maturation, in other words to assist him or her in mastering developmental tasks and to facilitate and appreciate his progressive steps. This attitude to the child's growing up is especially hard because ultimately it entails relinquishing one's parental satisfactions and helping one's child to assume parental status.

For the three-to-four-year-old boy or girl, the wish to be admired as well as curiosity about their loved ones focus initially on bodily characteristics and functions, extend to concrete behavior and gradually include mental traits and attitudes. They inevitably perceive that others are not only differently, and perhaps better endowed, but they may be bigger, stronger and more

skillful. Such discoveries may threaten the child's feeling of bodily intactness and mental adequacy, diminish his self-esteem and cause envy and anger. Psychoanalysts have drawn attention to these concerns and found that a number of later personality traits and pathologies are rooted in this period. I should like to stress a few points: (1) that both boys and girls may have concerns about their bodies and experience envy, anger, and loss of self-esteem, (2) that they may compare themselves to disadvantage with both mother and father, and (3) that the nature of their experiences, feelings and resolutions depends on many factors within and without the child's personality. Of these factors I wish to focus on the parents' role.

It is usually taken for granted that the boy's appreciation of and comfort with his sexual identity depends in some measure on the nature and availability of a paternal model: "He has trouble with his masculinity because he didn't have a father." It is less often appreciated that the child's ability to select some but not other aspects of the model for identification, depends very much on the nature of the father-child relationship and on the father's attitude to his son's manliness and growing up. Let us remember here that most little boys say, "When I am a daddy" rather than, "When I am a man." The father's relationship and support for the child's maturation are essential, making it possible for the boy to repair and overcome his feelings of littleness and inadequacy by sharing in the father's greatness and relying on his protection. "My daddy can count to a thousand," or "My daddy won't let you bother me." We know from our work with young children whose father has died how deeply they experience his loss as a personal diminishment and how inadequate and vulnerable they feel in comparison to children who do have a father. Not having a father, or having one who does not fulfill his role, greatly influences the boy's development during this phase. But the mother is also important since the boy is strongly affected by her attitude to men and to his own

masculinity. For example, experience with children of divorced parents shows how difficult it is for the boy's masculine development when the mother does not like the father.

Much of what has already been said about the boy also applies to the little girl. She does not need the father in the same way as a model for her own sexual identity but she too needs to know "what a man is about" in the widest sense of the word. Her self-esteem is immeasurably enhanced by his appreciation of her and by her opportunity to include him in her self-love. As a young girl patient once put it, "If you can't *be* a daddy, it sure is nice to *have* a daddy." Above all, the father helps pave the way for his daughter to learn that differences between people serve as a source of attraction and pleasure rather than of discomfort and misgivings. When I once asked a group of high school seniors why a five-year-old girl needed a father, one woman student replied, "She needs him to learn what it is like to be loved by a man." This is indeed a most important experience. It is only when the little girl is thus loved that she can appreciate and come to terms with the fact that her father's love for her differs from his love for her mother.

Although children forget the specifics of these early impressions, their experiences with their parents as a couple and as individuals remain with them in the form of ideals and values, and affect their perceptions of themselves and others. It is very difficult for children to integrate adaptive identifications and to structure their own personalities when one parent is physically or emotionally unavailable to them and/or the paternal and maternal figure do not maintain a marital relationship.

THE FATHER'S RELATIONSHIP WITH THE SCHOOL CHILD. Being left out of some aspects of the parents' relationship and finding that one cannot have one or the other parent all to oneself constitutes a healthy but painful disappointment. In its wake the child relinquishes some of his closeness to his parents, internalizes some of their attitudes and attributes and

turns to interests and people outside the family. He or she is on the way to growing up. For fathers, and mothers too, the relative loss of the special earlier relationship with the child is often difficult to adjust to, especially since it also represents the passing of a phase in the parent's own life. The child, however, needs his/her father most especially during the early school years. His model, his support of the child's achievements, his sharing of interests and willingness to discuss topics of joint concern, all are of great importance to the child's developing personality.

CONCLUDING REMARKS. The end of elementary school usually coincides with the first signs of adolescent development, when the importance of the father's role is widely acknowledged. I shall therefore limit myself to reminding ourselves that both father and child will have a good chance of weathering the storms and enjoying the richness of the adolescent years if the father has been able to fulfill his role as a father all along and if he has found satisfaction in doing so.

PART THREE
DEVELOPMENT OF
RELATIONSHIPS IN
HIGH RISK SITUATIONS

Behavioral Assessment of the Premature Infant: Uses in Intervention

by T. Berry Brazelton, M.D.

I will talk this morning about the use of behavioral assessments with premature babies, particularly in relation to their uses in intervention. I am going to be talking about work that is in progress.

In preparation for any understanding of the parents' reactions to premature birth, one must understand what they go through as they do the work of pregnancy.

There is a turmoil that parents normally go through during pregnancy, particularly in the last half of pregnancy. The period just before birth is the most critical. There's a kind of rehearsal of the task, which is normal: "Will I get to be a parent?" "Do I want to be a parent?" But there's another kind of rehearsal — a rehearsal of what one would do if (s)he had an impaired infant. "Will my baby be 'normal'?" "Have I damaged my baby?" "If I have a damaged baby, what in the world will I do?" About the eighth month the mother begins to turn inward and wonder about herself. She consolidates her feelings about the baby and now she's ready to deal with her own problems and making it through labor and delivery. Then she will be better able to see that baby as an individual.

What happens if you cut off two of those last months of work, the consolidation months? Does that leave her raw? "Will I make it at all with this baby or with myself?" When people have a premature baby, there's an inevitable process that I think always goes on, a kind of turning inward, of blaming oneself about what one has done to this baby. Parents feel helpless, hopeless, worthless, they are depressed and angry. Still, they try to keep themselves together, try to keep from feeling crazy.

In this period their defenses are high, defenses that are difficult for us as caretakers to handle. One inevitable

defense is *denial*. Denying that this matters. Denying that the baby is really sick. This defense helps them survive but it doesn't help them deal with the baby's illness, for they are often out of contact with it. Physicians today are so uptight about malpractice and explaining everything to the parent; yet co-workers come to me all the time and say, "I keep telling this woman what's wrong with the baby, and then she says something as if she never heard me." I think it's critical that we see this kind of denial as her defense against disintegration, against letting herself get out of hand.

The second defense is *projection*. Parents who are in trouble project either the good things onto the other person or the bad things, unpredictably and inconsistently. They'll say, "Do you realize that my baby's pH has shifted a little bit, doctor?" before he's read the chart. They'll say to the nurse, "It's three hours and five minutes, nurse, and you haven't fed my baby," at a time when the nurse is being pressured by other things. In other words, she projects her own feelings of inadequacy onto the medical personnel. This kind of projection serves a major purpose for the parents, but in our efforts to help, we sometimes fight against it as if we could get rid of it.

The third defense is *detachment*, that if you care about a baby, you might hurt it even more by your caring. Then you are very likely to pull even farther away from it, not because you don't care, but because you care so much and are afraid that you've already hurt the baby too much. Detachment is a very powerful defense against the kind of feelings of depression and inadequacy that are generated by having a premature baby.

When we started paying more attention to helping mothers with their grief, they looked like they were adjusting well, touching and handling their babies. But when they got ready to take them home, they were in an absolute panic. We have wondered if our expectations of these people to make it with their premature babies didn't push them very hard. Were they performing

for us in the nursery, looking as if they were making the attachment, when actually they were still grieving and having to defend themselves?

We've done something in our nursery that Anita Feins, one of my Fellows, is testing now. We are testing a system of five stages that we think parents have to go through before they finally get to the point of being able to make an attachment to their premature infant. The nurses now keep on their cardexes not only the baby's status, but where the parents are in their stages of attachment. (We have primary nursing so they start off with knowledge of the baby from the previous nurse, because of this record keeping.) For example, "Father is still in stage two. Work on him. Mother is in stage four, so you can let up on her." I think it is critical to give the nurses the challenge to help parents through a developmental sequence, to give them some goal for helping parents. The five stages that we think we can identify have become our way of pinpointing where parents are in becoming reattached and less defensive about their premature infant.

The *first stage* is when parents can only talk about the baby in terms of chemicals. They are wonderful at knowing what the PO_2 is, the pH, the PCO_2 , and they know what the sequence has been over the past weeks. The chemicals are their way of relating to that baby initially. The *second stage* is when they can begin to see reflex behavior, but it is always seen in terms of somebody else. If the doctor or the nurse touches him, he'll startle. If the nurse turns his head, he'll exhibit a reflex movement. The *third stage* is when they can see more human behavior, but it's still seen as a reaction to somebody else and not themselves. The parents may be touching the baby all this time, they may be gavaging, they may be giving PT, but when they talk about the baby or if you watch their behavior with the baby, they are still detached. They never look down into the baby's eyes. They see responsive behavior only in terms of the nurse or doctor: "When the doctor leans down and

talks to the baby, he alerts and turns to his voice." The *fourth stage* is when they can see responsive behavior in relation to themselves. "If I talk to my baby, she'll turn to me," and it's "my baby" by then. The *fifth stage* is when they can indeed pick up the baby and start doing things with it and for it, and they can relate to it behaviorally as well as verbally.

These stages take time and parents must get over the acute grieving before they can master each of these stages. I teach house officers to look for these symptoms as normal. When they can talk about the baby as we see it, we know they are ready to build a real effective working relationship with the baby. This is a kind of developmental sequence that is critical for us to see before we can expect parents to really begin to make the attachment that we all long for. Perhaps we should even postpone discharge until we do see the fourth or fifth stage developing.

Is there plasticity in the baby even with damage or immaturity, or are early deficits fixed? Or can we look at it in another way, that a positive experience is more organizing than a negative experience is disorganizing? It seems that positive experience can help organize an immature central nervous system, and there is learning that happens after a positive experience that may increase the chance for further learning thereafter. If that's true, then we must reevaluate the environments we put high-risk, raw, vulnerable babies into. How can we increase positive experiences for them? We certainly are overloading them with overwhelming, negative experiences. Are we paying enough attention to their positive experiences?

The literature indicates that if we are willing to look at their experiences as fostering development we might make bigger strides with high-risk babies. Peter Gorski, one of my Fellows, is finding that a positive experience not only raises the oxygen level but also is associated with some rather complex behavioral responses in very stressed preterm infants. Perhaps we could provide a

positive experience with the necessary negative experiences in order to reduce the destructive or negative aspect of the interaction.

In developing an assessment scale for prematures we wanted to utilize some of the information gained from the full-term neonatal assessment scale, and try to adapt it for prematures. We've become aware that using the full-term scale before 37 weeks might be inappropriate. The interaction between physiological and psychological demands is very different. In the premature you must measure either reflex motor behavior or autonomic behavior or the state control or the sensory-affective behavior, but not all at once. The interaction of these behaviors is quite different in a premie from a full-term infant. If you give a premie a visual or auditory display, he will deplete himself in the effort of trying to respond. The other day I was showing a baby to his mother. He was a 34-week premie that had been sick, so everybody wanted to get the mom attached to this baby. That day he was in great shape, although he still had some bronchopulmonary dysplasia. As I played with him, this 34-week-old baby was following my face back and forth and up and down, and the mother was saying: "Isn't he great, he's a person!" I was paying so much attention to the mother getting interested in this baby that I neglected to see what was happening to him. He began to demonstrate acrocyanosis, the limp arms and legs of exhaustion. After a period the baby stopped breathing and we had to intubate him to get him breathing again. That baby was willing to get into visual interaction with me and became so excited about himself, that he threw himself into apnea.

These are fragile babies. They are disorganized individuals, and we have no right to demand all that we might want back from them. If we let parents go home without knowing what an overloaded premie looks like, we are asking for the trouble that they can get themselves in. We've got to teach them the overloading signals, acrocyanosis, obligatory breathing, limpness of the

extremities, arching of the neck; all these show that "I've had enough." It is critical that they know the other side of their baby's reactions; we must teach not only about the positive experiences they need, but also about overloading such babies.

In assessing a premature infant, you must use the premie scale sensitively; when the baby begins to get overloaded, quit, and go back and continue another time. If you use the full-term scale, you must use it when the baby is already in room air. We now have eight qualifiers to add to the full-term scale. These take into account how hard it is to get performance out of the premature baby, what it costs the baby when you do, what the aftermath is, and how long the legacy is. These qualifiers do seem to differentiate among babies and do give us an opportunity to see the baby develop over time.

An assessment can also become a major form of communication between professional and parent. Viewing and sharing the baby between you is a powerful way of communicating. Understanding the process of performance as a way of discussing what the baby's been through, and for prediction for the short term are obviously useful. Using it for long-term prediction may well be foolish. By looking at where the baby is now, you can get parents to look at that baby with you, to see what they need to know about their baby. We want to utilize all the energy we were talking about that the parent was mobilizing in pregnancy, and that is still raw and unused, and turn it to good use with the baby. The most fascinating thing to me is that a grieving, hypersensitive, depressed parent can look at positive behavior in the baby and turn that grief toward positive use with the infant.

In the assessment of premature infant behavior there are at least four developmental lines we can follow. The four lines probably do not develop together if the baby is very fragile. For instance, a baby that is making motor progress is probably costing himself enough so that autonomic progress and attentional progress are not

going to take similar spurts at that point. The four lines that we follow are (1) physiological or autonomic responses (respiration, cardiac function, etc.), (2) motor development, (3) state control, and (4) attention and interactional behaviors. By distinguishing between these, you can see how one is making a spurt and the others remain stationary, and then another area will make a spurt to catch up. It almost seems as if these four lines work in parallel. The fifth line we score is how much regulation must come from the outside. What do you have to do to contain that baby, keep him under control, how sensitive do you have to be when he is tiring out? It is absolutely critical, if we are going to ally ourselves with parents, that we have our own role as a main focus of our attention. All this is a very important part of working with premies. Using this perspective ourselves has helped us to see the potential use of such awareness for others who are trying to bring babies out of difficulty.

The work of parents is what will bring these sick and premature babies up to their best potential. I am constantly amazed at the energy and determination that people have with which to overcome the difficulties in their infants. But they must see their babies as whole human beings, not just as a series of pathological parts. If they can see and identify the organization in their infants, they can do a much more complete job of bringing them to their optimal potential. When we look at our films of mothers, fathers, and infants, we begin to understand the work the parent has to put into the baby to get the social feedback she wants and needs. While she has to work so hard at it, she also is always at the mercy of the baby overloading, and shutting out. The mother learns to stimulate, yet contain the baby so she doesn't overload him, and to still allow the baby some autonomy of his own. The hardest thing for the mothers of our pre-matures is to allow autonomy as they develop.

I am amazed at how parents can identify, through us, the very minute bits of competence they can see in their premature babies if they are given a chance. My message

is that we must use our assessment techniques to reach out for and include the parents, because after all, they are the ones who are going to give these high-risk babies a chance at recovery and optimal outcome.

The Special Care Nursery: An Anthropological Study

by Lucile Newman, Ph.D.

What is the impact of the constructed environment of the isolette and the Neonatal Intensive Care Nursery on the preterm infant? The objective of this study is to describe the baseline life experience, and to observe in as minute detail as possible the social and sensory environment of the low birthweight infant living for an extended period of time in the controlled environment of the isolette. Where physical survival is a daily struggle, what are the possibilities of relationship in the first days or weeks of life?

SUBJECTS. We observed five female and five male infants with a gestational age of 28-32 weeks and birthweights between 980 and 1500 grams. Clinical condition was classified according to the amount of oxygen required; the resulting groups were infants breathing room air, those with oxygen supplementation, and those in oxygen and being treated with a respirator.

PROCEDURES. We used direct observation with precoded behavioral categories, together with tape recordings from inside the isolette, and physiological monitoring (heart rate, state, apnea). Each infant was observed for 24 hours once a week for three weeks. Every five minutes, heart rate, state, and motor activity were recorded. In addition discrete events were recorded, including interaction with another person, apnea, vocalizations, movements, and changes in facial expression and state.

Human interaction with the infant was recorded with a stopwatch and calculated in minutes per hour over the observation period. An interaction occurred when another person opened the isolette, spoke to the infant, handled him or engaged in stimulation of any sort. Staff interaction was differentiated into three categories: (1) routine care, defined as non-invasive actions such as cleaning the isolette or changing diapers; (2) moderately intrusive procedures including temperature taking and gavage feeding; and (3) painful procedures characterized by extreme invasiveness, such as blood taking, intubation, spinal taps, and other operative procedures.

Parental interaction was qualitatively different from staff interaction in that parents were not required to undertake intrusive or painful procedures. Consequently, interaction with parents was recorded simply in minutes per hour. Findings from the study have been reported elsewhere. This discussion is concerned with an exploration of some resulting hypotheses relating to communication.

PRECURSORS TO COMMUNICATION. The hierarchy of early functions has been described as first and primarily homeostasis — internal, regulatory, and conservative; and secondarily, because man is “a communicating creature,” as attachment — externally oriented, environmentally influenced, communicative. For the full-term infant, these all occur in the first days. For the low birthweight infant, they are more visible to us because they are like a slow motion film, occurring separately.

The full-term infant, thrust immediately into a social world, is surrounded with touching, smelling, vocal, face-to-face, orienting interaction. The low birthweight infant, literally isolated, not only receives these bits of sensory information separately but accomplishes integration of them sequentially and with an attenuated time scale, and perhaps by a different neurological route. They are signalling as we can see, but they are emitting signals without response.

In the ethological sense, all animals have calls, or ways of eliciting recognition from their environment. The African infant in a sling on the mother's back moves slightly and his needs are met. In modern Westernized societies, the infant, in his own room, cries for a response. The problem infant in the isolette can move and can cry and nothing much happens. If he stops breathing, bells ring, alarms go off, someone appears. What is being learned here?

Our study of preterm infants revealed consistent patterns of response to various stimuli. We suggest that these patterns are precursors to communication, and present them here for discussion in terms of expressive, conservative, and attentive modes of relating to the environment.

EXPRESSIVE. The infants are generally unclothed and lying flat in an enclosed isolette with temperature and humidity controlled. They are free to move about and their motions are visible. In the first week of the preterm infant's life there are, as for the full-term infant, many startles, jumps, and shudders, involuntary motions generally assumed to indicate the lability of the immature central nervous system. Voluntary motions include stretches, twists, whole body and localized motor activity. It was this latter category that caught our attention during the observations.

The interior landscape of the isolette is made up of yielding movable objects such as bedclothes, tubes and wires, and hard unmoving objects such as the oxygen hood, the external sides of the Plexiglas isolette and sometimes an inner Plexiglas heat shield. In the course of moving and being moved, the infant encounters all these. What was striking in our observations was the degree to which the infants seemed to engage in action that maximized contact with the hard surfaces. We called this activity "range-finding" since it seemed an encountering of boundaries, a factor in orientation. The pressure on those clear surfaces was often sufficient to

make the finger, toe, foot or arm white.

Over the three weeks of observations a difference developed which we described as a change from "touch" to "push." By the third week, some of the more mature infants were engaging in a chain of antecedent behaviors, with a slow modulated approach and preparation of the limb for contact. That is, the hand might be made into a fist before contact, or turned just before contact to present the back of the hand.

The term "range-finding" is used to suggest an active involvement or intendedness in maintaining contact with stable surfaces or moving rhythmically against them. Some infants had at least two points of body contact with the heat shield at all times; most had at least one limb in touch occasionally, for extended periods of time (20 to 30 minutes). With no heat shield, many infants managed through stretching and moving to contact the external wall of the isolette and remain in touch with it. This kind of behavior, exhibited by other animals in an "open field" situation, is perhaps an extension of in utero stretching. It was so consistent as to suggest an ordering function which was first, chance encounter, and then orienting.

It is our hypothesis that range-finding may be seen as a precursor to communication, identifying and confirming receptors for sensory stimulation and attentional focus.

CONSERVATIVE. What were the infants doing when someone was around? They met some interactions with eyes closed and others with eyes open.

To observe the infants under conditions of painful stimuli, we chose the most common stimulus presented to almost all infants in intensive care — the daily occurrence of blood-taking by the lab technicians. We observed five of our infants while having blood taken. All had had at least one previous experience of blood-taking. Characteristically, the infant's skin turned very red and the fists were clenched tightly. At first the infant did not move. When the lab technician returned later, the infant

cried before the procedure was begun, and continued to cry and move arms and legs during the blood-taking.

It is our hypothesis that aversive responses to pain/ul stimuli include a closing-out activity, and ultimately receptor shutdown (in this instance, a sleep-like state). Under circumstances where the normal expectable interaction is not taking place, the infant's consciousness is organized around pain, perhaps his or her most salient interactive experience. This suggested that one of the first attentive acts is defensive, *conservative*, in that it appears to be homeostatic, avoiding of noxious stimuli, and a conserving action.

ATTENTIVE. Most interaction in the intensive care nursery is with staff. During routine care, such as cleaning the isolette or changing diapers, there was either an attentional response from the infant or no visible response. The response to more intrusive or painful procedures was evasion or crying. Staff tended to stand and work, speaking over the top of the isolette. According to our audiotapes, voices were audible inside the isolette only if directed into the opening. Generally, the sicker the infant, the less time parents spent visiting, and the more time spent with staff, especially in painful interactions (Table 1).

TABLE 1
Summary of Parent and Staff Interaction Times by Infant Clinical Condition

Clinical Condition	Observation Week	Mean Interaction Time (min. averaged per hr. observed)		
		Parent	Staff	Total
Room Air	I	2.86	8.01	10.77
	II	2.67	6.49	9.16
	III	1.38	4.92	6.30
	(mean)	(2.27)	(6.47)	(8.74)
Oxygen Supplement	I	2.27	8.64	10.92
	II	0	7.29	7.29
	III	.41	7.22	7.63
	(mean)	(.89)	(7.72)	(8.61)
Respirator	I	.41	9.71	10.12
	II	0	11.49	11.49
	(mean)	(.21)	(10.60)	(10.81)

While parents are encouraged by the staff to participate in their child's care, for various reasons not all

parents wish to do so. There is a wide range of parent responses to the circumstances of preterm birth and the resulting infant of low birthweight. Parents' perceptions of their infants and the quality of human interaction in this study have been described elsewhere.

When parents were visiting, they tended to engage in benign interaction sitting at eye level by the isolette, stroking or playing with the baby, talking with each other and the infant. During this time, even for long periods, the infant tended to stay open-eyed and attentive, although not necessarily in direct visual contact. This observation confirms the observations of other investigators of attention during parent visiting. It has been suggested that the aversive response to the painful experience of blood-taking may, in the sense mentioned earlier, perform a homeostatic function, that of conserving energy and removing the event as far as possible away from awareness. The extensive *attending* to the parent visitor, maintaining awareness, may be seen as performing an attachment function.

CONCLUSIONS. The observations are suggestive of a variety of communicative functions. The behavior called range-finding is expressive, or directed out of the organism. It is stimulus-seeking and ultimately intentional. The behavior we have termed attentive to interaction of a rewarding or neutral kind may serve as a beginning of attachment despite the lack of direct and concerted interaction. All these serve an information receiving and sending, or semiotic function, and suggest further research on precursors to communication.

Then we must ask the clinical questions. What does all of this mean for the staff? To what extent are clinical phenomena related to the social circumstance within which this infant finds himself? Clinical implications of these findings would suggest attention to the social and sensory environment of the low birthweight infant, and recognition that the isolette is not "time out" from learning, but a social context in which development and

learning are taking place. An understanding of the infant's patterns of response and early development of communicative skills during everyday clinical interactions may help us to individualize care in the intensive care unit, humanizing to the degree possible an essentially non-human environment.

The Impact of Medical Complications on Parental Behavior in the Premature Nursery

by Klaus Minde, M.D., F.R.C.P.(C)

Our hospital in Toronto provides an ecologically very difficult place for premature babies as our intensive care unit has 65 beds, employs 145 different nurses and has a staff of up to 25 physicians. For this reason alone it is very difficult to make contact with the unit a human experience for parents and to help them participate in the growth and development of their baby.

Over the past few years our research group has examined four different phenomena in our premature unit. We initially looked at how a mother of a small premature baby gets acquainted with her baby, by asking questions such as "What does a mother do when she comes for her first visit to her baby who weighs less than three pounds?" or "How does a mother who comes four times a week differ in her behavior from a mother who only comes once a week?" The second question we asked ourselves was what contribution both the newborn and his mother make to their interaction during feeds later on at home. In other words, what maternal experiences or infant characteristics would be most highly associated with the mother's behavior towards her baby? The third question dealt with the extent to which maternal behavior in a premature nursery predicts a

mother's behavior with her baby at home. Finally, we also tried to examine how we could help parents to become more competent in their child caring practices and feel that they have an active role to play when they visit their baby in hospital and look after him at home.

The babies we looked at initially were our "well" babies, that is they had not been on a respirator, had no indication of intracerebral bleeds, etc. We did this because we did not know to what degree particular medical complications would affect the behavior of the baby in the nursery and later at home, or the degree to which they may affect the behavior of the parents towards these babies. Later on we wanted to know more about this issue, so we devised a system to quantify those complications most commonly found in a neonatal intensive care unit. Everyday we scored each of these complications on the babies we studied. This system allowed us to obtain a daily score and a score which reflected the overall degree of illness of each baby during his whole stay in hospital. Once this was done we could group our infants into those whom we called "sick" infants and "well" babies.

Of the first 100 babies we studied, 31 babies were seriously ill, 49 were moderately ill, and 20 were well children. All were born weighing less than 1,500 grams, with gestational ages between 25 and 32 weeks. We matched 20 well and sick babies, making 10 pairs based on four criteria: The ill infants all had respiratory illnesses, the gestational age of each pair could not be more than one week apart, their birthweights were within 100 grams of each other, and their parents visited at about the same rate. Among these pairs, the total illness score of the well infants was 18, versus 194 for the sick babies, a vast difference. The duration of hospitalization was not controlled, since the sicker babies obviously stayed in the hospital far longer. Babies do not stay in our hospital until they go home; we are a referral unit, so most babies are sent to the hospital where they were born when they weigh between 1,800 and 2,000 grams for

two or three weeks of growth prior to going home. The background variables of the parents of the two groups were basically the same. There was the same ratio of girls and boys and the same ages of mothers.

We then looked at four periods in each baby's life. The first observation of each pair was made when the sick baby was very sick, which was around ten days of age. The second observation occurred within a week after the baby got well, and observation three was two weeks later. The fourth observation was done when the baby was home for two months, and included both his mother and father. The ages of the sick and well babies were not matched after the first observation, partly because our well babies left the hospital much sooner.

During the first observation the sick babies showed significantly less behavior and less activity (arm, leg, mouth, and head movements) than the "well" premies. During observation 2, when the sick babies were better, there was no longer any difference in these behaviors. The same applied to observation 3. Thus in terms of the gross motor behavior of these babies we found that as soon as they got better, they caught up to where the well babies were all the time. When you look at social behaviors, such as vocalization and smiles, there was no difference between the sick and the well babies, primarily because such behaviors occur so rarely in premature infants, whether they are well or sick.

During observation 1, the mothers of the sick babies did far less touching and far less smiling. Their low level of interaction persisted through the third observation, although their babies had all increased their activity levels following their recovery from their serious illness. Thus during a feeding at two months in the home, the mothers of the previously sick babies still touched their babies significantly less, smiled less at them, and vocalized less to them than did mothers of the well babies. This pattern persisted, then, even though infant behaviors had significantly improved. This finding made us wonder what happened in the nursery as the babies

recovered from their illness and their behavior changed, but somehow the behavior of the mothers did not follow suit. While we obviously do not have a clear explanation of this phenomenon as yet, we did wonder whether during a long illness a mother becomes accustomed to and perhaps depressed by her baby's withdrawn condition and that this perception of her child as a "sick" infant then persists long after the baby has improved.

To explore further the association between duration of illness and the mother's behavior, we studied babies who had been very ill for at least 32 days, and those who had been ill for less than 17 days. As measured by our scoring system, the overall medical condition of the babies did not differ between groups.

There was no significant difference in the babies' behavior over three observations, whether they had a long illness or a short illness. They all showed fewer motor behaviors while they were ill, and increased their activity following their medical recovery.

During the first observation, all mothers showed relatively low levels of interaction. From observation 2 onwards, however, only mothers of infants with short illnesses increased their interactions; mothers whose babies had had long illnesses did not change their behavior over time. Somehow the mothers who had experienced their child's very long illness had a much, much harder time in recovering than the mothers whose babies had a short illness. At the fourth observation, in the home, the short illness babies did move and vocalize somewhat more. Their mothers also vocalized and smiled significantly more to them.

While these findings are preliminary it seems that parents of seriously ill infants are so overwhelmed by the precariousness of their baby's condition that they withdraw emotionally, and fail to perceive changes in their baby. So even if the baby gets better and starts to move and do all kinds of things, the parents still see him as "very sick," and behave as if he were very sick. That may be very important in terms of what we say to

parents because, as Dr. Brazelton mentioned, we can interpret to them how their baby has changed and try to make them realize that things are different now than they were a month ago.

In our hospital, I see all parents of premies when their baby is about three or four weeks old. I talk with them about a number of things, including their past life, their relationships with their own father and mother and the relationship between the parents themselves. We also talk about the kind of experience the mothers had during previous pregnancies and during this pregnancy, and whether she was able to see, hear and touch her infant after birth. We think this to be important as we found in previous work that the frequency of the mother's visits and how much she interacts with her baby are very highly correlated with how positive her past experiences have been. This way of looking at mothers has also allowed us to predict somewhat how mothers will interact with their babies when they are home.

When we correlated some of these interview findings and used this information to look at the groups of babies with long and short illnesses, we found some interesting trends. For example, for mothers whose infants had short illnesses, as well as mothers of "well" premies, there was a clear relationship between the amount and type of interaction the mother showed with her baby and her scores on particular background variables. However, for mothers whose infants had long illnesses, the individual mother's personal history did not predict her behavior towards this infant. In fact, all mothers of ill children showed a uniformly low rate of interaction with their infants. This suggests to us that the mother's past experiences which determine maternal behavior when her baby is "well" are overshadowed by the experience of having a very ill premie. In that sense her behavior is determined much more by the present condition than by her past life experiences.

While we were understandably fascinated by these observations, we were also aware that even when we

watch a mother and see her smile we really don't know what this smile means. Does it mean that this mother says to her baby "I love you" or does it mean that she says "I am so scared you are going to die that I had better smile"? To investigate this, at least superficially, we asked mothers after each visit how well they thought their baby was doing on that particular day. We then rated their apparent anxiety as shown by their verbalizations and interactions with their baby. With 36 of these observations, the mothers seriously overestimated the illness of their infants in 40% of the cases. In other words, they considered their baby to be far more ill than he was according to our scale. Thirteen percent saw the baby as a bit more sick, and 44% of mothers agreed with our morbidity rating. Only 2% of the mothers perceived their babies as less ill than the baby really was. In terms of anxiety, 30% of the mothers were far more anxious than they had reason to be based on their baby's condition. Seventeen percent were somewhat more anxious, 48% seemed appropriately anxious, and 4% were less anxious than they should have been. These findings seem to support the notion that our mothers generally were so overwhelmed with the illness of their children that they were not able to comprehend or accept their baby's condition. They thus created an internal image of their babies which was inaccurate in over half the cases. This may have very important consequences for their later interactions, since the expectations you have of your baby can determine your whole attitude and your behavior towards him.

In summary, we've found that the large motor behavior of the premature baby is related to his degree of neonatal illness. We also found that we have to be concerned about the parents' early relationship with an infant who has been ill for a long time. Furthermore, it seems that parents who have been bombarded with terrible news for a long, long time begin to internalize a specific attitude about their infant to such a degree that their perceptions of the baby are distorted by their hopes and fears for at

least the first six months of life. Because parents often misjudge their baby's illness and judge the baby to be more ill than he really is, we must be particularly careful in how we explain the complications and the progress of an infant to his parents. Furthermore, we must be conscious of helping them feel that they have something special to contribute that is essential for the future development of their infant, and in that sense make them an active partner even during the early weeks of the premature infant's life.

Family Oriented Intervention with the Failure-to-Thrive Infant

by Dennis Drotar, Ph.D. and Charles Malone, M.D.

Failure to thrive is a mental health problem of infancy which can be identified early enough to allow preventive intervention to reduce the emotional and developmental risk experienced by child and family. Failure to thrive is an important signal that the relationship between mother and child is compromised in ways that have great relevance for the child's later interpersonal relationships. Maladaptive interactions between these infants and their mothers, including diminished response to infant communications, tension-laden interactions, and insensitive overstimulation, appear to underly ambivalent or avoidant attachments in the child's later life (Gordon & Jameson, 1970). Long-term behavioral consequences include aggressive behavior in older children, severe feeding problems, and cognitive and learning deficits (Hufton & Oates, 1977).

With the exception of the sensitive work of the Infant Mental Health Program at the University of Michigan (Fraiberg, 1980), few intervention programs have addressed the parent-child relationship problems that accompany this common pediatric condition. Our own

clinical experience underscores many of the Michigan group's observations. In particular, we have been impressed with the powerful role that intrafamilial relationships play in the development of failure to thrive, and we have developed a method of intervention which addresses the family context of this problem.

The quality of intrafamilial relationships exerts a profound influence on the nurturing of infants in a variety of ways. For example, supportive relationships with extended family often serve to ease the young parents' transition from being single, toward joining as a couple. The quality of alliances with extended family are particularly salient for young parents who have not attained the maturity to be an independent, mutually supportive couple. Extended family members provide psychological support, permission, and reinforcement for the maternal or paternal role, and thus enhance the quality of parent-child relationships. A growing body of empirical evidence also highlights the powerful influence of the husband-wife relationship on parent-infant interaction. For example, Pedersen, Anderson & Cain (1977) found that those mothers who were more effective in feeding their infants were married to husbands who evaluated their skills more positively, while a high level of conflict in the marriage was associated with less competent maternal feeding behavior. Siblings are another salient influence on the infant's nurturing. The presence of many siblings, particularly young siblings spaced close together, presents an extraordinary challenge to maternal care-taking. Kendrick & Dunn (1980) found that the birth of a second child decreased the level of maternal attention and play and changed the quality of interactions with the older sibling. Following the birth of an infant, the number of positive interactions with the older sibling initiated by the mother decreased while the number of negative interactions increased.

Our observations of over thirty families of failure-to-thrive infants underscore the importance of the quality of

family coping with life stress as a factor in parental nurturing difficulties. Like other conditions of neglect, failure to thrive is often associated with a variety of inter-related stresses; poverty, unemployment, parental health problems, and premature birth all occur with higher than average frequency in the families of failure-to-thrive infants. Such parents often have more frequent than average childhood histories of neglectful or conflictual relationships with their own parents, as well as losses and separations (Altemeier et al., 1979). Parents who had inconsistent parenting models are often not as able to tolerate the demands of their infants or adjust to their child's unique temperament, as readily as parents who have experienced empathic nurturing as children. In turn, a limited or conflict-ridden understanding of infant needs and capacities can inhibit parental abilities to heed their infants' signals, hold them, respond promptly to their distress, or engage in empathic verbal and non-verbal dialogues.

However, our work has strongly suggested that the manner in which a traumatic or deprived childhood experience influences the mother-infant relationship is very much affected by the *current transactional context* of family life. For example, if the mother's current relationships with significant persons are threatened by conflict or loss, it may be especially difficult for her to contain ambivalent feelings toward her infant. Further, the personal hurt often associated with poverty and poor housing conditions is experienced even more keenly if relationships within the family do not allow for sharing or mutual support. A growing body of literature emphasizes the importance of family relationships as a source of emotional support which serves to buffer the effects of external stress. Brown, Bhrolchain & Harris (1975) found that emotional support from an intimate person was an effective buffer against depression for women who experienced difficult life circumstances. Kellam, Ensminger & Turner (1977) found that family structure was strongly related to the child's social-adaptation.

In an urban, largely black community, mother-alone families entailed the highest risk for the child, while the presence of supportive adults seemed to lessen this risk. The total family's social isolation also emerges as a factor which may trigger and perpetuate child maltreatment (Garbarino, 1977). Yet the sheer presence of potentially supportive persons in a family network does not ensure the nurturing of infants, particularly if infant care is haphazard, disorganized or intermittent.

Our clinical experience indicates that failure to thrive is almost always a signal of relationship strain, particularly among the infant's parenting partners, and of maladaptive family coping with life stress. When a failure-to-thrive infant is first hospitalized, intrafamilial relationships may be in varying stages of strain, conflict or isolation, as shown in the following cases.

Jesse is a young infant whose parents rarely talk to one another. Jesse's mother feels both unsupported and dominated by her husband but cannot express this conflict. In many ways, the mother's relationship with Jesse mirrors the isolated interactions between the parents. She cannot talk to Jesse or read his signals of hunger.

The three-month-old infant Summer, and her young, intellectually limited mother have become isolated from the rest of a very large extended family unit. Summer's mom remains in her room much of the day with her baby whom she treats very much as a doll. Summer remains cut off from the rich stimulation which is potentially available in relations with her mother and other family members.

Such families may be struggling to become or maintain a family unit with a coherent identity but lack the relationships and problem-solving skills needed to do so. Such parents tend to function as isolated individuals who fight with one another or retreat inward in the face of stress. Prolonged family conflicts serve to lower the mother's self esteem, deplete her emotional resources and

contribute to failure to thrive by affecting the quality of feeding and play. Mother and infant do not learn that pleasurable signals are forthcoming from one another, that their communications are heeded, or that their partner's responses are contingent on what they do. As this vicious cycle continues, mutual arousal and excitement can become progressively dampened, and interactions less frequent, thus depriving both mother and infant of further opportunities for social interchange and mutual learning. Eventually, compromised nutrition contributes to this cycle. The mother and other family members feel progressively more helpless in relating to their infant and eventually "turn off" responses to him or her.

Unfortunately, the family relationships that initially contributed to the infant's poor weight gain place grave constraints on the family's ability to recognize or change this problem. Such a transactional context is often too painful to address and is ignored. The infant's needs are lost in the drama and stress of family life. Cut off from potential sources of support because of conflict and estrangement, family members cannot help one another correct the infant's problem. Instead, the infant may be labeled as "small" or sick. This defensive maneuver places the origins and, even more important, the ways of improving the infant's nurturing, outside the sphere of family influence and control. By the time the child's poor weight gain is significant enough to be recognized, many families have adapted to the infant's problem, and can be remarkably untroubled by it.

As this scenario continues, pediatric hospitalization may be arranged for purposes of nutritional treatment and physical diagnosis. The clinician who is faced with the formidable task of intervening with the highly troubled families of failure-to-thrive infants faces a sobering challenge. Although hospitalization is often the first point of intensive clinical contact with a family and communicates the seriousness of the problem to the family, it is a mixed blessing. Hospitalization usually

focuses on the symptom of poor weight gain rather than the intrafamilial relationships which give rise to the problem. It also limits observation of the infant's transactional context, and can intensify families' sense that they are not involved in or responsible for the treatment of the child's problem (Barbero and Shaheen, 1967).

We feel it is crucial to persistently reach out and contact parents and other members of the family network to communicate the message that they are critical for their child's nurturing. In our model of intervention, hospitalization represents the *beginning* of intervention, which must be continued in the home environment and directed toward the following treatment goals:

1. countering patterns of family dysfunction that underly the infant's poor nurturing;
2. encouraging more adaptive intrafamilial relationships and more effective stress management;
3. facilitating better family communication and problem solving concerning the infant's nurturing, in order to secure a more salient place in family life for the infant.

We hypothesize that if one can facilitate positive change in one or more critical relationships within the family, the quality of the mother-child relationship might be enhanced (Bronfenbrenner, 1979). The flavor of this treatment is apparent in the following case vignette of a family that we've worked with for the past two years.

Randy was referred to us when he was two months of age. Already a veteran of a prior hospital admission for failure to thrive, his weight was way below the 5th percentile. He was irritable, stiff, and showed inconsistent social responsiveness. Included in the extended kinship unit were Randy's mother who was widowed a year before (her husband died suddenly of seizure disorder), his three siblings, ages 2, 4, and 6, his great grandmother and great grandfather who lived next door with Randy's two other uncles, and Randy's aunt, who often visited with her three children.

Randy's mother had long felt emotionally estranged from her parents who lived in the area but had only intermittent contacts with her. The availability of so many caretakers turned out to be a disadvantage for Randy's nurturing, as we learned in a brief observation early in the hospitalization. As soon as Randy fretted, his mother handed him over to her sister who took him willingly but related to him in a manner very different than his mother. Later on, home observations confirmed this pattern. Randy's mother could not soothe or feed Randy competently. Meal times were confusing, disorganized, and filled with the stresses of Randy's siblings, each of whom clamored for the mother's attention like so many hungry birds.

Our initial treatment goal was to centralize Mrs. C. as Randy's major caretaker by strongly emphasizing the need for one person to be Randy's mother. This goal was not easily achieved, as she was fearful that Randy was physically sick, and reluctant to assume complete responsibility for his care. We patiently explained that Randy was healthy but needed her attention and caretaking. Although Mrs. C. gradually assumed a more central role, she also expressed a good deal of ambivalence about it and chafed under the burden. For this reason, in concert with asking her to assume this burden, we tried to create a more adaptive nurturing network by asking Randy's great grandmother to help out at mealtime. By feeding Randy's eighteen-month-old sister, who had a history of undiagnosed failure to thrive and was particularly demanding, the great grandmother encouraged a calmer, more organized feeding situation. In this way, we intervened to structure and support the relationship between mother and her grandmother, as a critical family context. At the same time, we learned more about the severe conflict between Randy's mother and her own parents. Long emotionally estranged from her parents, Mrs. C. bitterly recalled her mother

making her take care of her sister, the family favorite.

Gradually, the structuring of the mother and great grandmother as a unit and the family recognition of the conflicts with Randy's aunt were associated with adaptive changes in the mother-child relationship. Whereas before Mrs. C. terminated Randy's frets during feeding by handing him over to her sister, she now interacted with him for longer and longer periods. She became progressively more confident with him, and took on more responsibilities for his care, and Randy gradually became less fretful. Although the relationship between mother and child was still less than optimal, and marred by breakthroughs of ambivalent feelings, a more consistent and more pleasurable relationship emerged by the time Randy was six months of age. As Randy began to want his mother and no one else, she was helped to see this as a positive sign of his attachment to her and less as a sign of his being spoiled. Randy's increasing attachment to his mother was supported by his great grandmother who commented, "He loves you Linda, he's mommy's boy now." Yet, Mrs. C. continued to view the relationship she had made with Randy as a burden and as a demand.

As this work continued, sessions were held to address conflicts which became more apparent between Mrs. C. and her grandmother. Mother and grandmother were close and lived next door to one another in a loose, chaotic arrangement. They imposed on one another, expected immediate mutual aid, and then became angry at one another when aid was not forthcoming. Continuing work has now addressed the slow process of encouraging a more adaptive separation between Mrs. C. and her grandmother. At nearly two years of age, Randy shows more normal weight and height, appropriate attachment to his mother, as judged in the Ainsworth separation-reunion

situation, and average cognitive development.

The efficacy of our method of family oriented intervention will be evaluated in an ongoing study with a comprehensive outcome assessment of:

1. the child's psychosocial competence including intellectual and language development, symbolic play, and attachment behavior (Ainsworth, Blehar, Waters and Wall, 1978);
2. physical growth, including height, weight, and head circumference;
3. parental perceptions of family life and the support they receive from a parenting partner;
4. parent-infant transactions as measured by monthly home observations using a computerized event-recorder, the SSR System (Stephenson, Smith and Roberts, 1975), which provides real-time recording of behavior, relatively unobtrusive home observation, and a powerful method of data reduction.

Maintaining engagement and a coherent goal oriented treatment focus with such families is extraordinarily difficult. At times, severe economic and life stress threatens to override the "hold" of our treatment. Working with these families has also acquainted us with ways of family life that are highly unfamiliar to us. We have faced the dilemma of trying to understand and preserve what aids survival in a family's life while preserving a safe space for the infant. We hope that the clinical methods developed in this study will be applicable to the increasing numbers of American families that are vulnerable to the kinds of financial and social stresses which contribute to the neglect and deprivation of young children.

Caring for the Caregivers

by Edna Adelson

A hospital with a large pediatric unit is, in some ways, like a curious large hotel. The guests are unwilling

travellers who have come for long or short visits to be healed and restored. The staff are those who stay on and who are too seldom given our proper attention. As resident caregivers they face constant crisis and stress. Together the families and staff meet questions about the quality of life and the possibility of death. These omnipresent realities create frustration on all sides, and a dedicated staff may find itself abused in subtle and not so subtle ways by a family that has reached its limit.

Like it or not, professionals automatically become heirs to the family's previous experiences with medical, educational or social authorities. When those experiences have been fraught with conflict, disappointment and helpless frustration, the expectation of the family is that we will fail in our efforts or condemn them for theirs. Furthermore, what is routine for the staff may be more than some families can manage. Suddenly the case explodes and the medical or nursing staff is faced with a non-medical problem which must be understood and resolved in order to treat the child.

The Johnsons and Kitty are an example of a family that added crisis to crisis. Their miserable history and their behavior in the hospital had everyone on edge, and for good reason. Care for the caregivers became as important as care for the baby.

Kitty Johnson was a healthy but totally blind three month old. Her blindness was due to bilateral anophthalmia, which means that her eye globes had not developed. She was born to a poor, uneducated, multi-problem family. Her brother, Henry, was two.

Two visits to Ophthalmology were needed to let Dr. R. assess and plan relatively minor surgery to prepare Kitty's ocular orbits to accept plastic conformers, to keep her eye sockets in proper shape until she was ready for prosthetic eyes. Hospitalization would be three days at the most. It should have been fairly routine, but the staff had a dilemma because, though the baby was no problem, the unpredictable and possibly violent family was.

On the first visit to Ophthalmology Mr. Johnson,

Kitty's father, repeatedly threatened the staff and subsequently fainted. Mrs. Johnson was too upset to observe the minimal procedures for the baby's eye care. The maternal grandmother was sure that eye transplants would let the baby see. No one accepted the blindness. The family was back now for a second visit with Dr. R., who found himself facing an extravagant and dangerous unreality. Kitty looked fine to him but he was gravely concerned for her parents. Dr. R. could not promise the miracles the family demanded, but he could find them expert non-medical consultation as a step toward the best medical care for Kitty. He knew of the Child Development Project's work with blind infants and their families, and called to ask me to help him with the family's extreme response to their infant's blindness. While I was on my way over he began to quiet things down for the family, for himself and for me.

Dr. R. located the family in an empty office so they could compose themselves. Then he found a quiet place where I could read the chart carefully and assemble my thoughts before meeting the family. I was introduced to them as a lady who knew about blind babies, and who would listen to the questions parents had about how blind babies grew up to be capable children.

While we talked, I watched Mr. and Mrs. Johnson care for their two children. It was easy to see how capable they could be when they felt calm, unpressured and recognized as parents who cared very much that life go well for the family. Not all families coming to the hospital remember to bring food and playthings for their children, but the Johnsons had. Henry's imaginative play soon included all the office furniture in some little town he was constructing for his cars and people; his alertness and organization were a signal to me that the conversation between his parents and myself was on target. Though we were talking about very difficult things, Mr. and Mrs. Johnson seemed to find relief in voicing their hopes, helplessness and recent experience.

I made small comments about what I was seeing, to let

them size me up and to keep the focus on infant-parent interactions. The verbal and non-verbal dialogue that continued was the strongest evidence of their devoted parenthood and I said so. Mrs. Johnson was very much in tune with her baby's signals and got great pleasure from Kitty's modest responsiveness. She was a nice baby, good to hold, and pretty, despite her anophthalmia. I offered some developmental guidance and practical suggestions to make a blind baby's world interesting. They were interested and we got on well.

Now there was other business to attend to. Something monstrous had prompted Mr. Johnson's attack on the staff. While Kitty slept comfortably and Henry played busily and listened to the story, I heard of assaults on the Johnsons since Kitty's birth. The entire extended family had been thrown into disarray. It was Mrs. Johnson's mother who insisted on the eye transplant; she would find her new granddaughter acceptable only if she had real eyes and could see. No one from Mr. Johnson's family could bear to see the baby. Instead, they had called everyone to announce the birth of a monster, urging all friends, relatives and neighbors to go and see the freak baby. Mr. Johnson generally had very little ability to cope with his intense feelings and very poor control of himself. But when he was able to talk with me, he could say how helpless and attacked his own relatives made him feel. He had reached the point where he placed a tire iron by the door of his home to kill the next person who came to cause such pain to his family.

We can understand that the threats and assault attempted on the medical staff were probably an odd way for Mr. Johnson to deal with overwhelming events. It was also his inarticulate and ineffective attempt to tell someone what he and his family had been through so recently.

We now had a history of real assault which led to the near assault in the hospital. We had a real baby with real parents and a real little brother. The Johnsons were ready to think of the hospital as a real place. There would be

no miracles, but there would be the best care that the doctors and nurses could give. And there would be cooperation between family and staff. Together we looked ahead two weeks to the hospitalization and surgery. Mr. and Mrs. Johnson wanted to meet the primary nurse who would know of Kitty's problems and understand the family's wish to care for her while she was in the hospital. Dr. R. and I arranged this, and I promised to come and visit them while Kitty was in the hospital.

Monsters and miracles were less the order of the day from then on. Staff and family fears had been modified to some degree. The assaults, born out of helplessness and hopelessness, had been partly replaced by more realistic expectations. Dr. R. had not responded to the family's upset with harsh authority, threats or punitive action. Instead, he had sought help. The family had been able to use it and appreciate it. I had welcomed his way of letting me meet the family in a calm state and I tried to do the same for the staff who would meet them next.

The ward staff also needed the hope of an alliance with reasonable parents. When the staff was afraid, it was hard to concentrate on the needs of any baby. A family who caused such fear became monstrous, unpredictable and could interfere with the care needed by Kitty and all the other pediatric patients. What we had achieved, we hoped, was an edgy but sufficient trust that would get everybody through. Reasonable anticipatory anxiety was healthier than raw fear.

With a primary nurse assignment, Kitty would not be overlooked. The social worker and I talked with the nurses in charge so that fears and worrisome expectations could be kept in perspective, the family strengths would be seen, and the staff need not be distracted from their concerns for other babies who were seriously ill.

The day before surgery the pediatric social worker called me. Things looked shaky. The family had moved twice in two weeks and Mr. Johnson had lost his job. This continuing misery was familiar to the family but the social worker felt helpless and discouraged. She said she

found work with them unusually draining. It was important to know this. It meant that each person meeting the Johnsons would need support from colleagues to keep a perspective on what could be done for Kitty, while accommodating to the family's anxieties in the hospital.

The day after Kitty's surgery I went to consult with Mrs. L., the primary nurse, and to visit the family. Worry and doubt about the family was growing again. Mrs. L. was very concerned. Their life was so sad and unstable. How well would they manage Kitty's special needs? How well would they take care of themselves?

I shared Mrs. L.'s concerns and let her know that a visiting nurse and social worker were alerted in the Johnson's home community. But there were also important things to do in the next two days to help Mr. and Mrs. Johnson know about Kitty's needs, and to help them feel adequate as parents. We turned our attention to the present and went to see Kitty.

The surgery had been uneventful. When we went in, Kitty was asleep with her sleeves pinned to the blanket so that she would not pull at the patches on her eyes. Mr. and Mrs. Johnson said they would feel better if we all stayed near Kitty so that they could watch her. Mrs. Johnson had already told the nurses she wanted to feed the baby and change her diapers. Mr. Johnson stood by the crib with his finger nestled in his baby's fist. I saw a family unit drawn together. They were exhausted but calm.

The parents had already done a great deal at home. They had picked up on almost everything that I had said two weeks ago. Mr. Johnson created an attractive toy to hang over the crib. To his great pleasure Kitty had found it, reached for it, played with it, and smiled and gurgled when she did. Henry was learning to play gently at her side, talking to her, and calling his parents to observe each time she laughed or smiled at him. The Johnsons were finding gentle, appropriate ways to get the social and affectionate signals they needed from Kitty in order to keep on giving love and attention to her.

It cannot be an easy assignment to be a primary nurse to a baby who is in the hospital for a brief stay, with a family whom everybody sees as unpredictable and possibly dangerous. Having a primary nurse for Kitty was meant to help the family focus on one person and minimize confusion and anxiety for the rest of the staff. However, one solution often prompts other difficulties; a primary nurse always walks a tightrope between giving close attention to the baby's needs while not usurping the mother's role. When the mother is present, this is not easy. There is so little time for nurse and mother to know each other, to feel comfortable with each other's competence while each stays in close contact with the post-surgery baby. Mrs. L. had done well, though, and the hospital stay turned out to be rewarding for the parents. They felt respected, helped and competent. They seemed to be unaware of how drained the staff felt in giving care to them and to Kitty.

In this mood the family and I discussed Kitty's after care. Neither parent felt they could replace the plastic conformers if Kitty were to squint her eyes and pop them out, because they were afraid of hurting her. As we talked it seemed to me the Johnsons were being quite objective, trying to sort out their feelings and attach them to real events rather than imagined horrors. They had come to see each professional authority as a possible ally who would understand and who would not blame them for being unable to do certain things for Kitty right away, who could help them face the future. We all hoped this would make them less troubling and difficult for professionals they would meet in the years ahead.

After the Johnsons left, the social worker and I talked about what had happened. We both felt that the family had been united by this crisis. Looking back, I think this was so in a large part because the hospital staff had been united. There had been a ripple effect with each staff member helping the next. The case work ended with a letter that I wrote to the ophthalmologist, to let him know that the cycle of informed and sensitive support he

initiated had paid off all along the way for staff, family and baby. I closed the letter by saying, "I know they were a most distressing couple to you a month ago, but that, in retrospect, was a measure of their desperate anguish. It was not a measure of their ability to understand or cope in the short term. I am so glad that you were willing to look beyond immediate impressions and seek for them all the hope and help they needed and were able to use."

This has been a report of staff cooperation and collaboration on behalf of a baby who happened to be blind. I know you understand that I never meant the emphasis to be on the blindness of the baby. I was trying to address the issues of this meeting: interaction and attachment, how they affect one another, and how they have consequences for the caregivers in the hospital. Each baby comes from and returns to a family. Knowledge of the most pressing psychosocial events at home can sometimes be crucial to the smooth functioning of a unit at the hospital. The caregivers in the hospital need to know they can count on the trust and support of their colleagues in their own disciplines and across disciplines. They need to expect and judge stress in themselves and their patients to decide when to turn for help.

Each hospital, each unit, and each staff member finds a way to create a network of trustworthy support, not only for the everyday events, but for the unusually difficult times. Without that kind of support, there are ruptures between disciplines, between staff and family, and between family and the patient, especially when the patient is a baby.

Feedback is important in maintaining such a system and this conference is yet another kind of feedback. It represents a kind of caring for all of you. The very format, which balances a large meeting with time for small discussion groups, is another way of showing care for caregivers. And it provides, on a large scale, a model that can be carried out on a small scale in each work setting. We all need informed support from our colleagues. We need to know about their work and we need them to know about

ours. The best networks among professional caregivers must always involve a structure that permits regular times to meet, to share despair and triumph, to recognize and diminish some sources of stress, and to realize how much we are each learning from the work and from each other.

There is one more point to be made. One measure of how things are going, for the caregivers and for the patient and the family, can be the moments of lightness. I do not mean gratuitous or cruel jokes, but a genuine sense of humor. It is a relief when a family can offer that to the staff as a sign of strength and perspective. For the Johnsons too much was too grim. With other families a good sense of humor can prevent an anxious retreat from each other; it offers a respite, and a reminder that life holds hope. The work holds hope as long as we can continue to care enough.

Comments on Burn-out

by Richard E. Marshall, M.D.

I would like to comment on burn-out in the neonatal intensive care unit. I would like to comment particularly on caring for caregivers because I am a neonatologist, and you cannot stay very long in that field without worrying about that. By burn-out we are talking about a loss of motivation for creative involvement. The symptoms are complex — physical, emotional and behavioral. Physically what happens is that when you get a cold, you think that you've got pneumonia. You exaggerate all your physical ills so that you can't come to work if you can possibly avoid it. Emotionally, you come close to depression. You really don't care anymore. In intensive care units, caregivers hope the babies will die before they get to them. They hope that nobody will knock on their doors because if they have one more knock, they're going

to jump out the window. Then they become very guilty about feeling this way, because they are supposed to be caregivers, and how can they have these grotesque thoughts towards the patients they're supposed to love?

Behaviorally, we observe a marvelous combination of over-involvement and detachment. On the one hand, you feel like nobody can do your job like you can. So that if anybody ever offers to help you, your first response is to punch them in the nose and make some obnoxious anti-social comment which will drive them far away. You end up being a lonely hero. You refuse help when you know very well you need it. On the other hand, you are very detached. Nurses stop coming to in-service training. You can't find the doctors. You see indifference and fatigue, but nobody takes time off, nobody takes vacations. You need a vacation, but that's the last thing the lonely hero can admit. The effect on our personal lives, on personal relationships, can be catastrophic.

What causes burn-out in intensive care units? In newborn intensive care units (NICUs) 20% to 30% of the patients die, but nobody expects babies to die. Birth is a time of joy and happiness, and yet we have to deal with death in babies. I think it is something anyone who has ever worked in an NICU never gets over despite constant exposure.

Ethical issues arise, such as who ought to live and what's the quality of life we are producing? Should we keep babies alive with hydrocephalus, intraventricular hemorrhages? Ethically, what should be done for those babies? How long should a baby with chronic lung disease be maintained on the respirator? Two months, five months, eight months? How do you make these decisions? Are you going to get thrown in jail if you make the wrong decisions? What will the parents do? What will the nurses do? Will somebody turn on you?

Unfortunately, the majority of work in intensive care units is done by physicians and nurses. We get little or no training that really equips us to work with families under stress. It is usually assumed that this is done by

psychiatry departments, and it may or may not happen in the critical context when we need it. This is a real lack in most medical educations as far as I can see. I understand that nurses also feel this stress very keenly. The social worker is perhaps the most qualified person and there aren't enough of them to go around.

Understaffing of medical personnel is a critical problem too. If you don't have enough nurses, you are not going to last very long. If there aren't enough neonatologists so that you can have a reasonable life-style, you are going to burn-out. You have to have time for your private life.

INTERDISCIPLINARY CONFLICTS. How do the doctors who have the authority deal with the nurses who have the responsibility? I have a very close friend in St. Louis who says the nurse is like the sergeant, trying to keep the lieutenant from West Point from going over the hill and getting killed. If the lieutenant is smart, he learns to listen to the sergeant, even though he outranks the sergeant. But a lot of lieutenants get bullets in their brains because they are not going to listen to the sergeants. It's a power conflict that has a lot of implications, especially with the expanded role of women in our culture. The old view of a nurse as hand maiden to a doctor has fortunately perished. But how is this handled? How should it be handled?

There are also conflicts within disciplines. What happens when different doctors feel differently about the management of cases? In our place, we have four attending physicians. We agree almost completely on medical care but, ethically, our views on life are extraordinarily different. We cause a lot of problems for our nurses when we can't agree among ourselves on some of these ethical decisions. It happens frequently. The environment of the NICU is organized chaos, at 80 decibels.

CHRONIC PATIENTS. I believe that neonatologists chose neonatology because they are aggressive people

who want results. We want a skin-to-skin "bonding" success in 20 minutes. But we get a patient who doesn't permit us to do this. We do see results, but progress is slow, in bits and pieces. It's quite a frustration to have the nurses turn to you and say, if you really were good, you'd know how to cure this baby with chronic illness. So, of course, we make some equally appropriate remark such as if they were really good nurses, they would know how to cure this baby. You can see the problems that ensue.

RECOMMENDATIONS. What can we do to prevent burn-out? One strategy is individual and one strategy is organizational. People have to take time to decompress after work. Some people do it in a tavern, some people do it by walking, some do it with music. It's important not to bring all the feelings home. That is very hard to do, very easy to say. I think people who work in neonatology owe it to themselves to have outside interests. If you're going to be competent for a long period of time, you must have something you like besides taking care of babies. Otherwise, you are going to break your heart in so many pieces, you'll never sew it back together again. Also, I think it is essential that you take time off from work. There's a marvelous quote by a famous Rabbi, Hillel, that I must give you: "If I am only for myself, what am I? If I am not for myself, who am I?" That says the whole thing.

ORGANIZATIONAL STRATEGIES. You can't do it by yourself. If the organization doesn't support the individual, then the individual strategies are not going to work. I believe you have to have an adequate orientation. We orient our nurses for six weeks, but don't do nearly as good a job with our house staff. When house staff comes into the unit they've already got 12 or 15 patients and half of them are dying.

We have a lot of meetings between nurses and doctors at our hospital. I meet with all the new nurses to find out their expectations of the job. We try to talk a little about

what we are going to be doing apart from taking care of patients, because in university settings neonatologists have many different responsibilities. We try to talk about burn-out and ethics with the nurses as well. Attending physicians meet with our nurses on a weekly basis to talk about problems and we also meet as a weekly neonatology group. In addition we brought in an outside psychotherapist for consultations with the nursing group. We think it's important to provide some outside perspective on the problems of units because we are part of the problem.

ADEQUATE STAFFING AND ADEQUATE PHYSICAL ENVIRONMENT. It would be nice to have a lounge for people with as little noise as possible, with time to be able to work at personal relationships among the staff. I agree with everything Edna Adelson said about humor. I think it's certainly a lot nicer if you can smile once in a while, because you just can't cry that much.

How do we handle death? When babies die, it has a tremendous impact on caregivers. Through our research on burn-out we found out what are the most difficult kinds of death to deal with. The deaths which give the staff the most difficulty are those involving ethical issues or chronic illness. Whenever we have a baby who has been in a unit for a long time, to whom the staff has become very devoted and this baby dies, it hurts a lot more than when a baby comes in and dies within 24 hours.

We must learn to acknowledge our feelings. If you are in a situation where you feel like grieving, do it. Not only do you care about the families and the babies, but you are getting the feelings out of yourself that must come out some way or another. So acknowledge your own feelings and define roles realistically.

I want to emphasize how important it is to be sensitive to your own needs as a caregiver. The shock of perinatal death affects all caregivers, although with a different

impact upon the nurses, the social workers, and the physicians. Somewhere in medical school, you got this idea that you practice magic on Thursdays and medicine on other days; it's nonsense. Realistic role definition means physicians should learn that they can't save every life. Only God can save lives on good days. All we can do is our best.

PART FOUR
CONCLUSION:
WHERE TO GO FROM HERE?

140

Application of Recent Findings to Clinical Care

by Marshall H. Klaus, M.D.

It would appear that we are in the midst of a revolution in perinatal care. Kuhn writes about a scientific revolution:

"Normal science is predicated on the assumption that the scientific community knows what the world is like. Much of the success of the enterprise arises from the community's willingness to defend that assumption if necessary at considerable cost. Normal science, for example, often suppresses fundamental novelties because they are necessarily subversive of its basic commitment."

Kuhn describes a mature scientist, and this could also be a physician, nurse or a perinatal researcher:

"The mature scientist's answers are firmly embedded in the educational initiation that prepares and licenses the student for professional practice. Because the education is both rigorous and rigid, these answers come to exert a deep hold on their scientific mind."

Are we suppressing fundamental novelties in perinatology?

I would like to begin by discussing some areas currently under reexamination.

(1) New information from animal data suggests the brain of mammals may change remarkably as pregnancy progresses. In a rat mother the pain threshold markedly increases as pregnancy progresses and peaks on the day of delivery, and then decreases rapidly. This is probably due to the effect of endorphin or to normal accumulation of morphine-like constituents in the brain of the rat mother. If these changes in the pain threshold occur in human mothers, what happens if we decide that the

mother can deliver and we induce her at an early date? Often when these women enter the hospital, labor does not progress smoothly, especially if we have miscalculated. The relief of pain that she would normally receive from her own brain morphine derivatives will not be present. For many reasons we must look carefully at the value of inductions versus the possible risks.

(2) Several years ago Dr. Kennell and I wanted a picture of a father, mother, and baby together. We arranged the father, the mother, and the baby in many different poses and they did not appear correct until we understood the following quote about fathers by Winnicott:

"He can help provide a space in which the mother has elbow room; properly protected by her man, the mother is safe from having to turn outwards, from having to deal with her surroundings at a time when she is wanting so much to turn inwards, when she is longing to be concerned with the inside of the circle which she can make with her arms in the center of which is the baby."

How should we view the father? What is his role in the development of the baby and the family?

(3) In Roosevelt hospital in Guatemala in 1975, the rate of infection among 8,456 babies was 17 per thousand. When rooming-in was instituted by the Chief of Pediatrics, the rate dropped to three per thousand, the next year two per thousand, and the following year three per thousand. How dangerous are normal newborn nurseries? Should rooming-in be encouraged more strongly for all mothers? Does the normal newborn nursery increase rather than decrease the incidence of disease?

(4) Next, I would like to consider the newborn and his talents, and the works of Winnicott, Trevarthen and Field, and raise some questions. Should parents be instructed in stimulation or will this interfere with parent/infant interactions that normally occur? What

normally does occur? Ten percent of the life of the baby in the first days is spent in the quiet, alert state. To learn what happens during this gorgeous state, we must review three lines of evidence from three separate disciplines.

Firstly, using pediatric and psychoanalytic observational techniques, Winnicott most astutely concluded over 20 years ago that the human mother is for part of the day a mirror for her baby. She naturally follows her baby, reflecting its behavior in her own. This is how the baby learns about himself or herself. Secondly, using fast film techniques and elegantly detailed analysis, Trevarthen demonstrated that mothers imitate their babies during spontaneous play. He suggested that this mimicry by the mother sustains the interaction and communication between mother and baby.

Lastly, Tiffany Field (Figure 1) looked at the mother spontaneously interacting with her three-month-old baby. She found that when the mother played with the baby, she looked at the baby 70% of the time, and the baby spent 70% of its time looking at the mother. When Tiffany Field asked the mother to get the baby's attention and stimulate the baby, the mother's activity went from 70% to 80%, but the baby's gazing at the mother went down to 50% of the time. The baby was being overloaded. If she asked the mother to mimic the baby, her activity went from 70% to 50%, and she slowed her pace, but the baby gazed at her more often. In other words, the baby was more active when the mother imitated the infant. Mothers of high-risk infants (Field studied middle-class mothers) spontaneously spent not 70% but nearly 85% of their time stimulating their babies. These infants looked at their mothers only about 45% of the time. When Dr. Field asked the mother to stimulate the baby, her activity went to nearly 100%, and the baby's looking at the mother went from 45% to 35% of each minute. However, when she asked the mother to mimic the baby, to move at the baby's pace, to find her own baby, the baby's gazing at the mother increased to 70%.

In other words, mimicry and the mother following the baby are apparently a significant style of interaction for the developing mother-infant relationship.

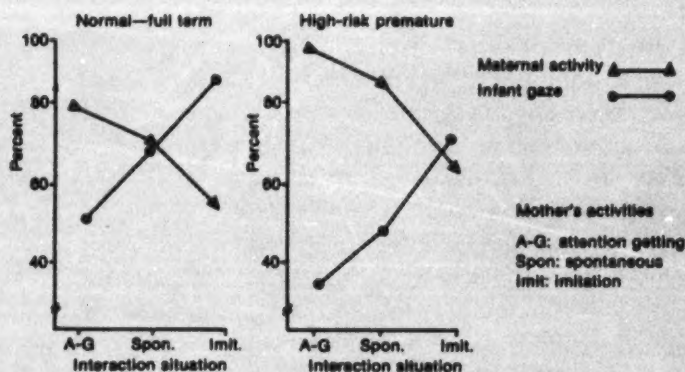


Figure 1. Relationship between maternal activity and infant gaze in three maternal situations: (1) attempting to get the infant's attention, (2) spontaneous interaction, and (3) mother imitating the baby. (Adapted from Field, T.M.: *Child Dev.* 48:763-771, 1977. Copyright The Society for Research in Child Development, Inc.)

So in the future we must watch closely what we recommend to parents. Should we tell them to stimulate, or to imitate their babies? Or rather should we suggest that they try to find their baby? At this time I am cautious about suggesting either activity to parents.

(5) Though the technological revolution in neonatology has allowed dramatic progress in the business of saving babies' lives, the beginning period has not been made easier for the mother. In this context, I would like to present an ongoing study of our research group of Drs. Kennell and Robertson and two nurses, C. Rudd and B. O'Bell. We are studying what happens when we take the premature baby to the mother rather than bring the mother to the baby. The babies are normal, healthy prematures weighing over three pounds. After approval from the doctor, mother-infant dyads are randomized;

half are given usual care. Babies in the other half are taken to the mother's bed, in another part of the hospital. The mother is moved over in bed, and the baby is undressed and placed in the mother's bed. A heat panel is placed over them, and the nurse sits on a high stool behind the mother's head. The mother can then explore and get to know her baby. The preliminary findings are exciting. When mothers visit their babies in the intensive care unit, they spend five to six visits just touching the extremities with their fingertips. In our experimental group, nurses Rudd and O'Bell have found that during the first visit, the mother starts by touching the extremities, and then quickly moves out to touch the baby's trunk. They spend 80% of the time looking at the baby, and move very close to the behavior we see in the mother of a normal full-term baby. Is this one way we can begin to manipulate our environment to improve the quality of the baby's life?

In closing, I am going to take the prerogative of the last speaker to suggest that we must consider how we go about the process of change. Firstly, I believe that before we make changes, we must evaluate the social as well as the biologic effects of the new treatment. Secondly, with the large number of changes possible, we have to have priorities. We cannot change everything at the same time. Thirdly, we shouldn't try to make changes that have insignificant or questionable outcomes. An example is the suggestion that children under six be permitted to view labor and delivery. It is extremely difficult to know what is going on in the mind of three-, four-, five- or six-year olds. It would take 20 years and many years of interviewing to know what it was like for a three- or four-year old to witness his mother giving birth. Among the first 20 children that were studied in Mt. Zion Hospital in San Francisco, one four-year old at the end of delivery said, "I will not have a baby, I am never going to have a baby"; another child cried profusely. All the children were prepared, and during the labor there was an adult available for each child. What significance does this have

for their development? This is a complex subject, and in my set of priorities, this is not something that I would try to institute at the present time.

I would try to change the system in areas where we have strong biological and social evidence. I would start with interventions that are cost-free, such as changing the birth position, adding a supportive person during labor, and providing extended mother-infant contact on the postpartum floor. Also, I believe it's time that we start to give parents more control of the delivery situation. This means that they must be knowledgeable and that on occasion we must support decisions we disagree with. For example, a mother may not want to breastfeed or may not want her baby all day in the hospital. These are their decisions and it's crucial that we truly give them the control.

In the future I see changes that will improve the quality of life for families during the perinatal period. The revolution in perinatal medicine has radically changed many areas of care, the consequences of which we are only beginning to understand. As we reexamine our care procedures, we must search for fundamental novelties that we may have suppressed, as Kuhn wrote, and we must define not only what is possible, but what is desirable.

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